Sustainable Development and Strategic Environmental Assessment (SEA) in the Context of the Saudi Arabian Planning Process: The case of Al-Qatif Oasis and its Settlements

Faez Saad Al-Shihri

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School of Architecture, Planning and Landscape,
University of Newcastle Upon Tyne
Newcastle Upon Tyne
NE1 7RU

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In the Name of Allah, the Most Beneficent, the Most Merciful.

To my family,
who all have always been the sources of patience, and prayers.

Abstract

The starting point of this study was the influence of the rapid urban growth that Saudi Arabia has experienced during the last three decades, which has had a negative effect on the environment in general and in particular has led to the loss of the natural resources of the agricultural land of the oasis areas. The study seeks to answer the following questions: How can we sustain development in the oasis ? Are there comprehensive policies in respect of urban development, including infrastructure, agriculture and water, and environmental protection? And what is the impact of these policies on the general environment and on the oases in particular?

The research covers a wide range of policies and the National Development Plans, which cover different areas of development such as urban development, infrastructure, agriculture and water, and environment, as well as other government activities within the authority of several agencies and ministries.

Al-Qatif oasis in the Eastern Province has been selected as a case study to illustrate the existing situation and the result of implementing the national policies in terms of physical development and environmental protection, and to highlight the factors which have resulted in unsustainable development in the Kingdom's oases.

The different experiences of other countries in relation to such concerns and the various policies of the Saudi government, such as urban, infrastructure, agriculture and water, and environment policies, are assessed and reviewed in general terms as well as more particularly in relation to the physical development and environmental protection of Al-Qatif oasis. Accounts are given of MEPA and MOMRA as the responsible bodies within the Kingdom for development and environmental protection, and general details of their institutional responsibilities and policies are provided in order to aid the analysis of the research.

The researcher adopted a methodology combining both qualitative and quantitative elements, a descriptive approach, a survey type of research design, and an interview data collection technique, in order to gather information for his study.

An assessment of the data gathered in relation to the research has helped to illustrate the factors contributing to the existing unsustainable development in Al-Qatif oasis and the loss of the agricultural land of the oasis as a valuable natural resource.

The findings show that Saudi Arabia has produced appropriate policies and has established the ministries and agencies to carry out these policies; as a result the people enjoy one of the best standards of living in the world. However, there are still in evidence some factors which cause concern in relation to environmental matters. These include the lack at national level of comprehensive sustainable development policies for the oases, such as would be aided by the utilisation of EA and SEA, the lack at local level of wide-ranging implementation of the existing national policies in relation to the physical development and environmental protection of the natural resources of the oasis, and the lack of a comprehensive institutional framework to implement the policies which exist. Other very important factors are the absence of comprehensive co-operation between government ministries and agencies in relation to the sustainable development of the oases, and the lack of public awareness of, participation in, and education about environment matters, all of which contribute to the existing unsustainable development in the oasis.

Finally, the study makes recommendations that would help and guide growth and change in the oases along the way of sustainable development.

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Finally, I hope that Allah may accept this work for his sake.

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List of Main Abbreviations and Acronyms

AMMNET	Saudi Aramco Air Quality and Meteorology Network.
ARAMCO	Arabian American Oil Company.
CEQA	Californian Environmental Quality Act (USA).
CM	Council of Ministers.
CPRE	Council for the Protection of Rural England.
DEA	Department of Environmental Assessment.
DMTP	Deputy Ministry of Town Planning.
DOE	Department of the Environment (UK).
EA	Environmental assessment.
EIA	Environmental impact assessment.
EIS	Environmental impact statement.
EPCC	Environmental Protection Co-ordination Committee.
GCC	Gulf Corporation Council.
GCDA	General Civil Defence Administration and the Ministry of the Interior.
GDEP	General Directorate of Environmental Protection.
FAO	Food and Agriculture Organisation.
HADCO	Hail Agricultural Development Company.
HCC	Higher Co-ordination Committee.
HUD	Housing and Urban Development body (California, USA).
IUCN	International Union for the Conservation of Natural Resources.
JIC	Jubail Industrial City.
MCE	Ministerial Committee for the Environment.
MEPA	Meteorology and Environmental Protection Agency.
MOA	Ministry of Agriculture and Water.

MOFNE	Ministry of Finance and National Economy.
MOIE	Ministry of Industry and Electricity.
MOMRA	Ministry of Municipal and Rural Affairs.
MOP	Ministry of Planning.
NCWCD	National Committee for Wildlife Conservation and Development.
NDP	National Development Plan.
NEPA	National Environmental Policy Act (USA).
NMEC	National Meteorological and Environmental Centre.
NRA	National Rivers Authority (UK).
NRUN	National Report to the UNCED.
OOABNM	The Organisation of Al-Amro Bil Maroof Wal Nahi Anil Monker.
PBUH	'Peace be upon him' (used in association with the name of Mohammed).
PEIR	Programmatic environmental impact report (California, USA).
PPG	Planning Policy Guidance (UK).
PPP	Policy, plan, and programme (PPPs – policies, plans, and programmes).
REDF	Real Estate Development Fund..
SEA	Strategic environmental assessment.
SOE	State of the Environment (Report).
TCPA	Town and Country Planning Association (UK).
UGB	Urban growth boundary.
UNCED	UN Conference on Environment and Development.
UNEP	United Nations Environment Programme.
WCED	World Commission on Environment and Development.
WCS	The World Conservation Strategy.

WHO	World Health Organisation.
WWF	World Wildlife fund for nature.

Glossary

Amanah	A super municipality in Saudi Arabia.
Amarah	The regional (provincial) administration.
Hadith	Sayings and traditions of Mohammed which have been memorised and subsequently recorded by the companions.
Haram	Protected zone.
Hema	Land reserved for public good.
Hisbah	The office of public inspection to ensure that public and private land, resources and property are put to proper use.
Ihya	Land reclamation or development.
Ijarah	Land lease.
Iqta	Land grant.
Jinn	Both the Qur-an and hadith describe the jinn as a definite species of living being. Jinns are created out of fire, like man. They may believe or disbelieve.
Kalefah	Vicegerent or tenant or steward.
Kelafah	Trusteeship (Muslim teaching).
Milk	Private ownership of land.
Miri	Public ownership of land.
Mushama	Joint stock company.
Shariah	The Muslim code of religious law.
Sunnah	A traditional portion of Muslim law based on Mohammed's words or acts, accepted (together with the Qur-an) as authoritative by Muslims.

Waqf	Land devoted charitably to the public good, often under the management of religious authorities..

Chapter 1

Introduction

CHAPTER 1 Introduction

1.1 Introduction

The issue of environmental concerns, in a very simple sense, goes back to the late 1800s. However, in recent years the issue has become more complicated and it has gained considerable attention from both individuals and governments (Pezzoli, 1996). Many government groups and international organisations have intervened by producing and setting policies to regulate and control the various human interactions with the environment.

In relation to this mention can be made of many examples, such as the National Environmental Policy Act (NEPA) of 1969 in the USA, and the Friends of the Earth groups in France, Sweden, and the UK. In addition reports and guidelines have been presented by many governments, for example environmental appraisal of development plans and PPG notes (Pezzoli, 1996).

At the international level the World Commission for Environment and Development (WCED) organised a series of international conferences concerning the relation between environment and development. Our Common Future (WCED, 1987) made the term 'sustainable development' well known around the world. Other series of international conferences concerning the relation between the environment and development have been introducing and emphasising sustainable development, the most notable being the 1992 UN Conference on Environment and Development (UNCED), known as the Earth Summit, which took place in Rio de Janeiro.

These national and international conferences organised by government and environmental groups have introduced and proposed tools, means, and guidelines for sustainable development. One of these tools is strategic environmental assessment (SEA), which can be used to evaluate policies, plans, and programmes concerned with development (Brundtland, 1987; Sevageldin, 1994).

It is widely accepted that planning practices have a role to play in achieving sustainable development (Rydin,1998). Planning can contribute to the prevention of depletion of natural resources and the prevention of damage to the environment. In addition, planning can provide guidelines for physical development based on the carrying capacity of the environment (Germeraad, 1985).

SEA as a comprehensive process of assessing the environmental impacts of plans, policies, and programmes can be used as a way to make the sustainability concept operational (Therivel et al., 1992). However, Our Common Future also has promoted the significance of linking sustainable development to land use planning.

Land use planning as the provider of guidelines for physical development can be integrated with SEA in assessing the environmental impact of plans, policies, and programmes. For instance, many national governments have been developing concepts and guidelines on environmental considerations in plans, policies, and programmes, the UK government being an example. They have produced several guidelines to improve environmental consideration in development plans and latterly the environmental appraisal of such plans (DOE, 1991; DOE, 1992a; DOE, 1993). Wood (1988) concludes that there are two ways of linking environmental assessment with land use planning: one is environmental assessment of the plan after it is prepared, and the other is environmental assessment in plan-making, which is an interactive process during a plan's preparation. Rivas et al. (1994) conclude that the incorporation of environmental assessment as an integral part of the planning process should help in reducing undesirable environmental effects. Kleven (1996) concludes that planning is regarded as a useful and effective tool for national and local integration and co-ordination of environmental concerns.

Internationally a common understanding of environment issues is developing, but nationally each country differs in terms of context, planning legislation, and environmental policy and tools.In the Kingdom of Saudi Arabia prior to the discovery of oil, nomadic groups constituted 60 % of the total population. Those of the Saudi population who were not nomadic lived for the most part in rural communities and pursued agricultural activities and commerce. However, some urban centres existed,

namely Makkah, Madinah, Riyadh, Jeddah, and Hofuf. With the discovery of oil in the 1930s Saudi Arabia began to experience rapid growth in all spheres of life. With the increase of Saudi oil income since the early 1970s, much effort has been directed towards the economic and infrastructure development of Saudi cities and villages. This has resulted in the rapid urbanisation of most Saudi cities and villages (Al-Ankary, 1989).

This rapid growth process produced a rapid transformation in the patterns of the cities and settlements in the Kingdom of Saudi Arabia. Major urban social, economic, physical, and environmental problems were experienced during this swift urbanisation development (Al-Soliman, 1993).

1.2 Problem Statement

To deal with problems resulting from rapid development the government of Saudi Arabia has established governmental agencies and special authorities, which have been delegated the necessary powers and duties, such as provision and implementation of the required policies.

With the provision and implementation of the development policies in Saudi Arabia, it is clear that there are major environmental problems all around the country. There are negative impacts of development on the sea, air, and land. In particular there is loss of agricultural land in the oases, which are not renewable resources and which can provide food and employment long after the oil resources are finished.

One of these oases is the Al-Qatif oasis region, which is one of the most important oases in the Kingdom of Saudi Arabia. It plays a very important role in sustaining agricultural and economic activities, such as supplying food, particularly dates, vegetables, and fish, and supplying pearls from the Gulf waters. In addition its location on the Gulf makes it ideal for commerce and trade.

Various studies have indicated a very clear problem resulting from rapid urban development, and that is the invasion of agricultural land by that development. For

example, between the 1960s and the 1990s the stock of agricultural land in Al-Qatif oasis shrank from 7,534 ha to 5,798 ha, and in the same period urban land development increased from 495 ha to 5,080 ha. A total of 2,213 ha of agricultural land has been lost forever in the process of the invasion of agricultural land by urban development.

In addition, to meet the demand for urban development, reclamation of land from the seabed has negatively impacted on the coastal ecology. If this land development pattern continues the entire oasis, with all its agricultural land, is expected to disappear in the next 20 to 30 years (Al-Afraj, 1994; Al-Oqail, 1994).

This loss of agricultural area and this sea landfill have had a negative effect on the environment, and the urban growth has resulted in a disturbance of the fragile habitats in the area of Al-Qatif oasis. The government has established planning policies to develop the country; the government has also established government agencies and ministries to implement its policies. Meanwhile it has set up several environmental policies to protect natural resources and the environment. A key question is whether these policies are effective

The term 'sustainable development' is used in national development plans and is clearly intended to signify a very important environmental policy. Yet it is general and has no clear procedure associated with it. In relation to this, in advanced developed countries the governments have established general policies and frameworks for the protection of the environment in order to achieve sustainable development, and they have set up the means to apply these policies at every level from national to local.

However, protecting the environment and achieving sustainable development is one of the hottest topics at national and local level in Saudi Arabia. As recently as 26 April 1998 HRH Prince Sultan Bin Abdulaziz Al-Saud (the Second Deputy Minister, Minister of Defence and Aviation, and Chairman of the Ministerial Committee on the Environment) in a speech entitled 'Human and the Environment' emphasised the

protection of the environment and the need to sustain development in Saudi Arabia.

He stated:

> We need to reach the right way to achieve sustainable development according to our Islamic and traditional values, which will lead to satisfying the need of our existing generation without affecting the next generation. (See Figure 1.1.)

However, it seems that there is a lack of comprehensive implementation of the existing national environmental policies at the oasis level, which has resulted in gaps in their application at local level (Al-Gilani, 1998). This is a very important issue and needs to be studied and assessed in order to identify the factors that affect the oases and may result in their loss. Specifically comprehensive national environmental and planning policies should be set up and well delineated in order to ensure the protection of the environment in general and, at local level, the oases in particular.

الوطن

اليوم AL-YAUM

٥ الاحد ٢٩ ذوالحجة ١٤١٨ هـ ٢٦ ابريل (نيسان) ١٩٩٨م . العدد ٩٠٨١

رعى أسبوع الجامعة والمجتمع

الأمير سلطان يدعو إلى تضافر جميع الجهود من أجل المحافظة على البيئة

سموه: الإسلام أمرنا بإثراء البيئة وإغنائها

الرياض - صالح العيد - واس

رعى صاحب السمو الملكي الامير سلطان بن عبدالعزيز النائب الثاني رئيس مجلس الوزراء ووزير الدفاع الطيران والمفتش العام رئيس اللجنة الوزارية للبيئة مساء امس بجامعة الملك سعود اعمال اسبوع الجامعة المجتمع الثاني الذي يقام تحت عنوان الانسان والبيئة.

ويهدف الاسبوع الى تعريف المجتمع بامكانات الجامعة البشرية والمادية وعرض مختلف الخدمات العلمية والفنية التي تقدمها الجامعة ممثلة في اجراء البحوث وتنظيم الندوات والمؤتمرات والدورات التدريبية وبمناسبة مايتعلق منها بالبيئة.

وقد كان في استقبال سموه لدى وصوله مقر الحفل معالي وزير التعليم العالي الدكتور خالد بن محمد العنقري

Figure 1.1. HRH Prince Sultan Bin Abdulaziz Al-Saud in his speech entitled 'Human and the Environment'.
Source: Al-Ayaum newspaper, 26/4/98. No. 9081 (in Arabic).

The government's concern about natural resources and the protection of the physical environment is exemplified by recent statements by HRH Prince Abdullah Bin

Abdulaziz Al-Saud, the Crown Prince and Deputy Prime Minister and Head of the National Guard. In May 1998 he approved first the policy of banning the distribution of land for development to private individuals or public bodies on one stretch of the kingdom's coastline (the area of coastline south of Jeddah, on the west coast of Saudi Arabia). He followed that by approving the new governmental policy related to environment protection at the local level (No. 1445 in 28/1/1419 H, May 1998) sent to the Ministry of Municipal and Rural Affairs (MOMRA), which set out the banning of the distribution of coastal land to private individuals or public bodies for development up to a distance 400 m inland, in all of the Kingdom's coastal areas (see Figure 1.2).


Al-Jazeera Newspaper Friday 22/5/1998G, No 9367

المسؤولون ورجال الأعمال والأدباء يتحدثون لـ«الجزيرة» عن قرار سمو ولي العـ

أمين جدة : بدأنا بإعداد الدراسات اللازمة لتهيئة الشواطئ

سمو ولي العهد يهنئ الرئيس اليمني

Figure 1.2. HRH Prince Abdullah Bin Abdulaziz Al-Saud in the public newspaper about the established new policices.
Source: Al-Jazeera newspaper, 22.5,1998, No. 9376 (in Arabic).

It has been noticed by the researcher that the existing policies applied by the planning department at local level are not enough to stop the loss of agricultural land in the oases (see Chapter 7). Furthermore the existing national policies, such as environmental, agricultural, water, and urban planning policies, do not emphasise the

oases in particular, and they are not comprehensive and general. This has a negative affect on the oases at a local level (see Chapters 3, 4, 5, and 7).

For example, there are frequent complaints from local residents in different parts of Saudi Arabia, some obtained from exploratory field observation and others published in the media, regarding the difficulties and the negative effects they face as a result of the failure of authorities at local level to consider the environmental impact of implementing urban development and land use planning (see Figure 1.3).

Figure 1.3. Complaints from the residents of environmentally sensitive areas.
Source: Al-Jazeera newspaper, 1998, No. 9337 (in Arabic).

The research therefore gives attention to the impact of national policies at local level in general, and to physical planning development and environmental assessment in particular. If policies at the national level are comprehensively set up and well integrated with each other, and if environmental assessment is comprehensively used as a tool in the physical planning process, then we will be in a better position to develop guidelines for sustainable development practices at Al-Qatif oasis and its settlements.

It is evident that there is a lack of policies concerning the integration of physical planning and environmental assessment, and in addition there is a negative impact associated with other factors (environmental, agricultural and water, and physical development policies) (Al-Soliman, 1993).

The lack of comprehensive and effective policies related to the environmental assessment of the plans, policies, and programmes at national and local level is a problem facing the planners. This lack is not addressed by the previous and current foreign and native models of physical development in the oases in the kingdom. However, consideration of this should have been one of the fundamental guiding principles in developing the oases in the kingdom.

Due to the lack of effective integration and co-operation in matters of information and data between the different government sectors involved in physical development, the result has been a developed area characterised by lack of comprehensive consideration of the natural capacity of the oasis or the economic, social, and environmental importance of such development in the long term The oasis is therefore in the process of disappearing and losing its agricultural land. This may be expected to increase the negative impact on Saudi economic, social, and environmental patterns.

Planners and policy makers in urban development, agriculture and water, and environmental sectors should consider the importance of development and environmental protection, i.e. protecting renewable resources (the agricultural land of the oases) when using a non-renewable resource (oil) during the development process, as it may not last for ever.

1.3 The Aims and Objectives of the Research

The complexity and lack of comprehensive sustainable policies regarding the development of the oases in the kingdom and the protection of its renewable resources (mainly agricultural land) suggest the need for related academic research.

The research aims to define and develop guidelines for sustainable development practices in the oases in Saudi Arabia. It also aims to assess development policies in different sectors (urban development, infrastructure, agriculture and water, environmental), and to identify the impact of these policies on the oases.

In relation to this various questions for study have been set up: why the agricultural land in the oases is vanishing; how we can sustain development in the oases; whether there are comprehensive policies in urban development, including infrastructure, agriculture and water, and environmental protection; and what the impact is of these policies on the general environment and on the oases in particular.

The research covers a wide range of policies and national development plans, which include different sectors of development such as urban development, infrastructure, agriculture and water, environment, and other policies within the authority of several agencies and ministries.

The definition of environment discussed in this research includes issues of physical environment like air, water pollution, depletion of resources in general, and loss of agricultural land in the oases as a natural resource in particular. The research covers the assessment of policies that relate to the development of the physical environment and environmental policies to protect natural resources in the process of physical development. It also covers the impact of these policies at the local level.

Al-Qatif oasis in the Eastern Province is selected as a case study, to investigate its sustainability during the physical planning development process. The previous and existing plans, policies, and programmes which have been carried out in the oasis will be assessed to understand and to pinpoint the factors that have affected the oasis in a negative way, and which could be taken into consideration by planners and decision makers in future developments and modifications.

These are needed in order to provide more sustainable physical development for the oases of the kingdom in general and in the Al-Qatif oasis in particular. It is assumed that the final conclusion of this research will benefit:

1. The municipality which has control over the physical development of Al-Qatif oasis, to enable it to take appropriate action in relation to sustainable development in the oasis.
2. The academic community.

In order to achieve the aims of this research certain objectives were set. These included:

1. Review the historical background of sustainable development as follows:
   a. A study of the concept of sustainable development.
   b. A review of the tools to achieve sustainable development in different countries.
   c. A study of the Islamic perspective of sustainable development.
   d. A review of strategic environmental assessment (SEA) as a tool to achieve sustainable development, and the experience of the application of SEA in various countries.
2. Assess the Saudi Five-Year National Development Plans (NDPs) covering the years 1970-2000, and other government documents in relation to:
   a. Development policies (infrastructure).
   b. Environmental policies.
   c. Agricultural policies.
   d. Physical planning policies.
3. Identify the factors that affect the oases.
4. Conduct a case study (Al-Qatif oasis) to investigate and assess the following:
   a. Historical background.
   b. Transformation of the oasis and its environmental stress.
   c. Previous and existing physical development plans, policies, and programmes.
5. Develop and propose sustainable development guidelines for the future development of the oases.

1.4 Methodology of the Research

To achieve the goals and objectives of this research the following stages were identified and followed (see Figure 1.4):

1. Stage one is the research exploratory framework, which describes the content of this chapter; this includes the main subjects and background of the research, the statement of the problem of the research, the aim and objectives of the research, and finally the research methodology and research structure.

2. Stage two is the conceptual framework. This consists of a literature review and analyses of the historical background of sustainable development, the Islamic perspective on the sustainable development concept, and SEA as a tool to achieve sustainable development, and its definition, concept, methodology, limitations, process, and application.
3. Stage three is the Saudi Arabia framework. There is a literature review and analyses of the importance of the oases in the kingdom are offered. The background of the natural setting of Saudi Arabia is described, and an account is provided of urbanisation and development in the country. Urban and regional planning policies and NDPs are discussed, along with economic development and the output of the development process, as are the impact of urbanisation and development on the environment in general and the oases in particular.
4. Stage four. This consists of assessment of the case study area (Al-Qatif oasis) in terms of the former and current plans, policies, and programmes relating to it, in order to assess its sustainability and identify the factors that have contributed to the loss of the agricultural land of the oasis, and in order to produce guidelines for future sustainable development for it.
5. Stage five is the final stage, in which conclusions are drawn about the learning experience gained from the conduct and completion of this research. Potential future related research directions on the subject are indicated.

In general, in the study stages, the following research methods have been followed:

1. Literature review and analysis.
2. Documentation analysis.
3. Case study technique and related methods(field observation, photographic survey, and interview and questionnaire survey)

An account of how these steps were carried out is now given:

1. The literature review involved searching for, reading, and processing literature sources about the concepts of sustainable development, physical planning, and SEA. The literature on these and related topics was obtained, as available, from various libraries. However, technical reports, publications, policies, programmes, and plans relating to Saudi Arabia and to the case study area were obtained from

various ministries and other bodies in Saudi Arabia, such as the Ministry of Planning (MOP), the Ministry of Municipalities and Rural Affairs (MOMRA), the Ministry of Agriculture and Water (MOA), Dammam Planning Department (DPD), Eastern Province Municipalities (EPM), the Meteorology and Environmental Protection Administration (MEPA), Saudi ARAMCO, and King Faisal University. These sources of information provided a good foundation for the research to be undertaken.

2. The documentation analysis method was used to collect data about development policies in Saudi Arabia in general and Al-Qatif oasis in particular. Most of the relevant data was in documentary form in material produced by the MOP and other government ministries and agencies mentioned above. They consisted of technical reports, written reports, plans, policies, programmes, proposals, news clippings, and other articles appearing the in mass media and government publications.
3. Field observation and photographic survey were undertaken to assess the existing condition of the case study area, for example its physical and other natural environment, landscape, and features. Photographs of the area and features of the case study were taken. (see section 1.5, 'Methodology of collecting data', for more detail.) ,a qualitative and quantitative research techniques (interview and questionnaire survey) were carried with officials in different government agencies and the residents of Al-qatif oasis to gather information related to the research topic. (see section 1.5, 'Methodology of collecting data', for more information).

1.5 Methodology of Collecting Data.

1.5.1 Introduction and Case Study Technique.

A key role of this research was to assess the impact of certain policies on the planning of the oases in the Kingdom of Saudi Arabia and to integrate the SEA with planning practices.

Stages						**Methods**
• Research framework	Introduction					
• Conceptual framework	Historical background of sustainable development concept	Islamic perspectives of sustainable development concept	SEA, definition, limitations, methodology, application			• Literature review
• Saudi Arabia framework	Natural setting of Saudi Arabia, importance of the oases	NDPs (MOP)	Environmental Policies (MEPA)	Agricultural and water policies	Physical planning policies	• Literature review • Documentation analysis • Interview survey • Direct observation
• Assessment of the plans, policies, and programmes in the case study area	Examining and assessing former and existing plans, policies, and programmes	Assessing the environmental impact of the physical development	Assessing officials' views and knowledge of the existing issues			• Documentation analysis • Reports, maps, technical reports, photo analysis and assessment • Questionnaire and interview survey
• Conclusion	Conclusion and recommendations					

Figure 1.4. Stages of the research and methodology.

To do this a field study has been conducted as the best way to deal with the research in hand, a decision supported by Shaffir and Stebbings (1991):

> Unlike controlled studies, such as experiments, field studies avoid pre-judgment of the nature of the problem and hence the use of rigid data gathering devices and hypotheses . . . Rather, their emission is typically the discovery of new propositions that must be tested more rigorously in subsequent research specially designed for this purpose. (p. 18)

The research at hand and the type of questions this research is intended to deal with indicated the case study method of research as the most appropriate (Yin, 1989, Yin, 1993; Hamel et al., 1993; Stake, 1995). Therefore Al-Qatif Oasis has been selected to answer the following questions : Are there comprehensive policies in urban development including infrastructure, agriculture and water, and environmental protection? What is the impact of these policies on the general environment and on the oases in particular? Why is the agricultural land in the oases vanishing?.

The case study method can accommodate either the qualitative approach, or the quantitative approach, or both of them together (Yin, 1989, 1993; Stake, 1995). Both of these approaches produce descriptive data and they are of a highly exploratory nature, but they can also provide some explanations about the topic under research (Moser and Kalton, 1986; Yin, 1989, 1993; Stake, 1995).

Further, Moser and Kalton (1986) argue that using these approaches in a case study is helpful in providing a comprehensive picture of the situation under inspection because of their potential for flexibility and detailed investigation. They also permit innovation and a degree of informality in their application, which allows the researcher to make use of any type of evidence obtainable through his investigations, provided it is relevant (Hakim, 1987).

For conducting the in-depth examination of the study at hand there was a need to define at the beginning the strategies of data collection. In connection with this Ragin and Becker (1992), Yin (1989, 1993) and Stake (1995) argue that more than one technique could be used together in conducting research that is environmentally related. In the same vein Patton (1987) states:

> There are strengths and weaknesses to any single data collection strategy. Using more than one data collection approach permits the evaluator to combine strengths and correct some of the deficiencies of any one source of data. (p. 60)

More than one technique was applied in this study, in order to have a clear understanding of the subject from different angles or different points of view, and so that the data would be mutually supportive. In order to answer the above questions in regard to the case study, and to acquire the necessary related knowledge of the research topic, three techniques commonly used in such research were chosen. Therefore, each area of the research demands its own investigation technique. The case study will incorporate the following techniques:

- archival study
- photographic survey
- field observation
- survey by interview and questionnaire.

1.5.2 Archival Study

This technique covers collecting data about the case study area. It deals with materials which are available at the relevant agencies and departments, such as reports, maps, studies related to the investigated subject, and other pertinent documents. The material of most importance to the researcher is the planning policy documents and studies produced by the Ministry of Municipal and Rural Affairs (MOMRA) as the major ministry responsible for physical development. Planning policies, master plans, and other government plans are of the greatest importance to the proper conduct and evaluation of the case study. It is from this material that evidence can be gathered to show the existing and intended future plans for the area of the case study at hand, and it is this material, in particular the various government plans introduced in this thesis, which can be used as a tool in assessing the case study area.

1.5.3 Photographic Survey.

> Photographs of people and things stand as evidence in a way that pure narrative cannot. In many senses, visual information of what the people and their world looks like provides harder and more immediate evidence than the written word; photographs can authenticate a researcher's report in a way that words alone cannot. (Ball and Smith, 1991, p. 16)

Further, Ball and Smith (1991) argue that photographs do not translate from appearances; they quote them.

Nachmias and Nachmias (1996) support that by stating:

> In field research the primary sources of data are what people say and do. Researchers may record the behaviour they observe by writing notes, tape recording and on occasion photographing or videotaping. (p. 291)

The visual materials to be used in this research are still photographs showing the existing conditions of the case study area and some evidence to indicate the existing problems caused by human behaviour in the oasis as it affects its natural resources. It is argued by Jorgensen (1989) that still photographs are a useful tool since they record mechanically, and they permit comparison, sorting, analysis, and interpretation in much the same way as verbal or written records. In relation to this Jorgensen states:

> Aside from being a way of recording the visual details of the physical environment, photography is especially useful for making records of non verbal human scenes and interactions. (p. 103)

1.5.4 Observation

However, site observation is employed to obtain more accurate qualitative and quantitative data. The information gained by such observation has the advantage of being direct rather than obtained through the reports of others (Moser and Kalton, 1978). Observational evidence is often useful in providing additional information about the topic under study, and it can add new dimensions for understanding either the context or phenomena under investigation (Yin, 1989). Observation techniques

are used to ensure the accuracy and reliability of information obtained through the literature review and the interview. As Patton (1990) comments:

> To understand fully the complexities of many situations, direct participation in and observation of the phenomenon of interest may be the best research method. (p. 25)

The observation of the impact of urban development on the oasis has been carried out mainly by photographing the existing physical environmental problems caused by urban development.

1.5.5 Survey by Interview and Questionnaire.

Of all methods of data collection used by the social sciences the survey-interview is the best known and the most popular. Millions of interviews are conducted yearly in order to obtain data about various investigated subjects and opinions (Kvale, 1996). The idea of using a survey-interview for data collection for this research was not mainly to obtain numerical data but to illustrate how oasis planning development is affected by various factors. Thus the format of the interview used was the 'semi-structured interview'; this has two types, which will be explained later.

It is a technique in which the interview has a predetermined series of questions on topics or issues that need to be explored (Madden et al., 1982; Patton, 1987; Foddy, 1995; Kvale, 1996). This type of interview allows the researcher to obtain in-depth and specific information from the people involved in producing the planning documents, policies, and programmes which developed the oasis.

Since the information is generally qualitative in nature it is important to include in the record some of the actual words and phrases of the interviewees, which can be analysed and interpreted later (Schuman and Presser, 1981; Foddy, 1995).

Urban development policies, environmental policies, agricultural policies, development control policies, and Islamic values are introduced and analysed and conclusions are reached. The survey-interview has been a major source of data used

in policy assessment, especially when written documents have not been available or not enough, in this thesis.

A questionnaire in this research was arranged to get information from officials. Letters were sent from the sponsoring body (Saudi Arabia Cultural Bureau and King Faisal University). However, setting meeting times and sending and distributing the questionnaire were done primarily through personal contact and initiative. The interview and questionnaire were invaluable in identifying the concerns of local officials and understanding the issue of sustainable development and its tools, as well as environmental issues in Saudi Arabia and their implementation at local level.

The aim however, of the interview and the questionnaire was to understand how and to what extent the officials in the various agencies, and especially the agencies responsible for physical development and the environment, understand and feel concern about the issue of sustainable development and its relationship to the loss of agricultural land in the oases of Saudi Arabia.

It was impossible for the researcher to develop this interview without a thorough understanding of the complicated issues that relate to environmental and other relevant policies in Saudi Arabia as well as sustainable development and the protection of the Kingdom's oases.

The structured questionnaire techniques were of two main types: the first cover several agencies in the Eastern Region, where the case study area is located, in order to gain an understanding of their awareness of the topic in hand. These agencies included the *amarah* (the provincial administration body), and the *amanah* (the municipality local authority) in Dammam, Khobar, Al-Hassa, and Al-Qatif, as well as other local branches of the different ministries involved in the environment and in planning issues. These included the National Committee for Wildlife Conservation and Development (NCWCD), the Ministry of Agriculture and Water (MAW), Meteorology and Environmental Protection Administration (MEPA), and Saudi

Aramco (S. ARAMCO). 80 samples in total were completed; they are structured in eight sections (see Appendix I for more details).

1. The first of these deals with the development and the environment of Islam, and aims to elicit information about the officials' knowledge about the integration of Islamic values in the development planning process.
2. The second deals with sustainable development, seeking information about the officials' knowledge and concern about sustainable development issues in general and their application tools and their emphasis in the government's plans and policies.
3. The third section seeks to elicit information about the nature of officials' concern for and awareness of environmental problems, their causes and the reasons behind them in Saudi Arabia.
4. The fourth section relates to renewable and non-renewable natural resources, and aims to obtain information about the awareness and concern of officials while implementing development and planning activities in this area, and the awareness of the officials of the impact of development on these resources.
5. The fifth section deals with environmental policies in Saudi Arabia and seeks to find out about the views of officials on existing policies in terms of content and application and their relation to other policies and agencies.
6. The sixth section has to do with government institutions and environment problems, and the future of planning and development in the Kingdom.
7. The seventh section aims to obtain information about the views and concerns of officials in relation to existing environmental problems caused by the planning and development process within government institutions, and how they might see ways to combat these problems.
8. The eighth section deals with comments and suggestions from officials on the topic of this research, in order to elicit information to be used when conducting this research as well as to understand their responses and views on the research in hand.

The second type was in-depth open ended with the planners involved in the physical development in Al-Qatif Oasis. Questions focused on the following: the importance of environmental impact assessment (EIA) for physical development projects before the approval stage; how co-operation is achieved between the *amanah* and MEPA and other responsible bodies in the environmental field and physical development field in the plan making process; whether the existing planning policies and standards are enough to deliver sustainable development in the Oasis; whether there is co-operation between the *amanah* and municipality and MEPA in terms of information provision at the national level or the local level; what the level of co-operation is of the Oasis's residents in the process of the physical development and environmental protection in the Oasis; and finally questions focus on any comments on the existing Al-Qatif Oasis development plans and studies (see Appendix I). 9 samples were completed.

In addition, a guided interview which was carried out with residents and various land and property offices in Al-Qatif oasis. The guided interview does not usually obtain information that can be statistically analysed, although the interviewer may include a few questions that can be quantified (Bradburn and Sudman, 1979; Foddy, 1995). An interview is basically a form of social interaction; therefore various skills must be considered, some of which are social skills (Payne, 1951; Survey Research Centre, 1969). These skills include having a good attitude and being a good conversationalist, interest in others, a comfortable relationship with others, and an ability to put others at ease. Although the 'questioning' of local residents and interests was less structured than the 'questionnaire survey' of the officials, nevertheless the opinions of approximately 200 local residents were canvassed and evaluated.

Van der Zouwen and Dijkstra (1982) point out that improving the quality of interview data should be based on an understanding of the interview process itself. In relation to this, as it is a guided interview, the interviewer should be alert to ambiguities in the respondents' responses and to deliberate or unconscious deceptions (Bradburn and Sudman, 1979; Madden et al., 1982; Patton, 1987; Foddy, 1995).

Interviews with various land and property offices in Al-Qatif oasis were used to investigate some points related to the responses and attitudes of the residents in connection with the following matters (see Appendix I):

- land supply and demand
- the size of the plot
- the residents' awareness of socio-cultural values
- the price of land and the effect on the residents.

As far as land supply and demand was concerned the researcher sought to ascertain the extent and the nature of the knowledge of potential land purchasers of the factors affecting supply and demand. The researcher was keen to find out what they knew about demographic change, about economic factors affecting construction costs, about design matters, about housing and other regulations, about vacant land (whether planned or unplanned), about environment regulations and their application, if at all, to the planning and construction of dwelling houses, and so on.

Also of interest was the residents' knowledge of plot sizes, both from the economic and other points of view. It was of importance to learn whether environmental issues were taken into account when residents selected or sought plots, whether there was any consideration of traditional Saudi house design in the choice of the amount of land to use, or whether only setback regulations were taken into account and residents were prepared to expand upwards to save on the cost of land, while at the same time abandoning traditional street and neighbourhood patterns.

Further, enquiring whether the residents were aware of socio-cultural values was important in order to elicit information not only about traditional values touched upon above relating to house design and location in connection with Islamic family and privacy customs, but also information relating to the awareness of residents of environment matters and how they tied in with Islamic teaching about the place of nature and man's role as its custodian. In addition it was important to enquire whether such considerations played any part in the choices people made regarding the location and style of the buildings they constructed.

Furthermore, what effect did land prices have on residents' options? We have touched on this to some extent in the preceding paragraphs, but it was important for the researcher to pinpoint it specifically as a potentially decisive factor in the choices that residents made about where and in what circumstances to live. To what extent did residents connect land prices to other factors in the development/environment scenario?

Regarding the factors influencing the development planning of the Al-Qatif oasis and its sustainability, all techniques that were used in collecting the empirical data for this research were used to ensure the validity of the results. In connection with this Silverman (1994) argues that it is an increasingly accepted view that work becomes scientific by adopting methods of study appropriate to its subject matter. In the same vein Kirk and Miller (1986) state:

> The assumptions underlying the search for objectivity are simple. There is a world of empirical reality out there. The way we perceive and understand that world is largely up to us, but the world does not tolerate all understanding of it equally. (p. 11)

To sum up, all the above methods were used to gain as much data as possible on concern for the environment in general and in particular the impact of losing the oases through the planning policies of the Saudi government. In total more than 289 questionnaires and interviews were carried out to inform the research. This may pave the way for fuller investigation of the hypothesis stated above, and to tackling all the issues related to environmental involvement in the planning process. It may lead to an understanding of the extent of environmental knowledge of those involved in this process. The design of the interview and questionnaire means that this knowledge will be general as far as broad issues are concerned, and more specific in regard to the oases.

1.6 Scope, Limitations, and Difficulties of the Research

The research was carried through at two levels, the national level and the local level. At the national level the national development plans, policies, and programmes are assessed through these plans, policies, and programmes of different ministries and agencies that have an impact on physical development and the environment. These are MOMRA, MEPA, MOAW, and MOP. At local level the case study area is limited to the boundaries of the Al-Qatif oasis, which is located in the Eastern Province and consists of 25 settlements. It covers a total area of 400 sq km, 20 km north of Dammam city.

The context of the integration of the plans, policies, and programmes at national level is assessed to point out the issues and factors that may have negative impacts on oasis development at local level.

The research study assesses the plans, policies, and programmes for development applied at the local level in the Al-Qatif oasis to point out the factors that will help the oasis to be developed in a sustainable way for the existing generation and the next generation.

The establishment of new policies during the time of ongoing research means it has been difficult to cover all policies.

There have been some difficulties in retrieving data due to the restricted access to some information, and the fact that some data was still in the process of publishing approval (or was for some other reason not yet published).

1.7 The Research Structure

To achieve the specified aims and objectives of this research, the thesis has been structured in nine chapters, each dealing with certain topics related to the aims and objectives, building towards the final analysis and recommendations.

1. Chapter One introduces the research aims and questions and additionally describes the methodology used and the general structure of the research.

2. Chapter Two is a historical background overview of the concept of sustainable development and the evolution of sustainable development. In addition the Islamic perspective is given on the concept of sustainable development, and SEA as a tool to achieve sustainable development is discussed, in terms of its definition, limitation, methods, process and application in different countries. This will provide useful information regarding the research in hand and help to define the ways and concepts of reaching sustainable development through different perspectives.

3. Chapter Three defines the general background information about the natural setting of the Kingdom of Saudi Arabia. The importance of the oases in the kingdom is set out. There are accounts of urbanisation and development, of urban, regional, and national planning processes and policies. In addition economic development and the output of these planning policies and the impact of this development on the environment in general and the oases in particular are described. Finally the government agencies and ministries involved are introduced. This step is essential in discussing and defining the image and frame of the problem of this research in general, before discussing the case study.

4. Chapter Four is a discussion and assessment of the Saudi Arabian environmental policies, documents, and administrative structure. This covers the assessment of the environmental policies in the Five-Year NDPs, and ministries and other agencies involved in environmental protection in general and protection of the oases in particular. This discussion and assessment will help us to understand the policies and their context and impact on the general environment and the oases in particular.

5. Chapter Five is a review and assessment of the agriculture and water policy documents which are set out in the Five-Year NDPs, and their integration with other policies. Their impact on the protection of the general environment and the protection of the oases in particular is discussed.

6. Chapter Six is an assessment of the role and policies of the Ministry of Municipal and Rural Affairs (MOMRA), which is the main ministry responsible for physical development. This includes the policies stated in the Five-Year NDPs and other government publications and policy documents. This step is essential in discussing and assessing the role, processes, and different types of planning practised by MOMRA while engaged in development, and in pointing out the relationship between MOMRA and other government ministries and agencies providing physical development.

7. Chapter Seven defines and discusses the case study area, Al-Qatif oasis. Use is made of relevant maps, site photographs, surveys, and other documentation and information materials about the study area, in order to provide a comprehensive overview of the situation.

8. Chapter Eight is a discussion of the environmental stress in the oasis and the findings with interpreting data collected from the case study area through the interview survey and field survey.

9. Chapter Nine contains summaries and identification of the major points that affect the sustainability of the oasis and presents guidelines and proposals for future sustainable development in general and in the oasis in particular. In addition to the conclusion a summary of the research and recommendations for future research are presented.

Chapter 2

Sustainable Development, Islam and Sustainable Development, and Strategic Environmental Assessment

2.4 Strategic Environment Assessment (SEA)

2.4.1 SEA Definitions

2.4.2 The Need for and Importance of SEA

2.4.3 Types and Applications of SEA Systems

2.4.4 SEA in Various Countries

2.4.4.1 The United States of America

2.4.4.2 The Netherlands

2.4.4.3 The United Kingdom

2.4.4.4 Australia

2.4.4.5 Canada

2.4.4.6 Malaysia

2.4.4.7 Spain

2.4.5 SEA Methodologies

2.4.6 SEA Limitations

2.5 Summary

Notes

CHAPTER 2 Sustainable Development, Islam and Sustainable Development, and Strategic Environmental Assessment

2.1 Introduction

This chapter in its first section introduces and discusses the term 'sustainable development', its definition and principles, and the tools to be operated in connection with it. An account of the history of writing on sustainable development is given, as well as an account of planning principles and instruments.

The understanding of Islamic law on the protection of nature and on human activities in relation to nature, as the basis of development in Saudi Arabia, is also introduced. The chapter offers a general account of Islamic teaching in relation to the earth and its natural resources, illustrated with quotations from the Qur-an and the *hadith* (traditions of the prophet Mohammed). It will relate the practice of sustainable development to Islamic law and teaching, and will discuss some of the important institutions and precepts based on *shariah* (Islamic law) which contribute to achieving the objectives of Islamic law in relation to the environment and planning, indicating how they are applied in Saudi Arabia today.

The final section introduces and discusses in detail the definition of 'strategic environmental assessment' (SEA), the need for SEA , its application in some countries (with a particular in-depth look at the situation in the UK), its methodology and the limitations of applying SEA.

2.2 Sustainable Development Concepts and Planning

2.2.1 Historical Development

The environmental movement began as long ago as the late 1800s. However, the 1970s saw a major turning point in the use of sustainability as a concept to guide development rather than as a preservation and conservation tool (Llewellyn, 1983, Pezzoli, 1996).

In 1987 Brundtland produced her report for the World Commission on Environment and Development (WCED) called Our Common Future, which defined sustainable development as the 'development that meets the needs of the present, without compromising the ability of future generations to meet their own needs' (p.8). Brundtland indicated that sustainable development requires meeting the fundamental needs of all and offering to all the opportunity to satisfy their aspirations for a better life.

The report introduced the elements of the concept of sustainable development as shown in Table 2.1.

1.	Reviving growth
2.	Changing the quality of growth
3.	Meeting essential needs for jobs, food, energy, water and sanitation
4.	Ensuring a sustainable level of population
5.	Conserving and enhancing the resource base
6.	Reorientating technology and managing risk
7.	Merging environment and economics in decision making

Table 2.1. Critical objectives for environment and development policies that follow from the concept of sustainable development.
Source: Brundtland (1987) p. 49.

These objectives stressed that growth must be encouraged and revived where the links between economic growth, the elimination of poverty, and environmental conditions operate most directly. Development requires taking account of all its effects on natural resources. The increasing of food production should be based on ecologically sound

production policies, and urbanisation development processes should be managed to avoid the reduction in the quality of life.

Natural resources must be conserved through scientific assessment of land capacity and must not exceed the rate of regeneration. New technologies used in the development process should be assessed in relation to their impact before they are used to ensure that their use does not put stress on the environmental resources. Sustainable development requires changes in the institutional frameworks by taking into account community knowledge and public participation in the decisions that effect the environment.

In addition the Brundtland report emphasised that sustainable development requires the elimination of negative impacts on the quality of air and water, and other natural elements. In general the report described sustainable development as a process of change in which the use of resources, the direction of investments, and the orientation of technological development, as well as institutional change, are in a harmony with future and present potential to meet human needs.

In relation to her statement of the demands of sustainable development, Brundtland explained that sustainable development involves change in the content of growth and that the process of development must be more soundly based upon the realities of the stock of capital that sustains it. This means that a main objective must be the conserving and enhancing of the resource base. The emphasis is placed on resources such as agriculture, fishing, and forestry and how they have been over-exploited. These resources must be conserved, and land use in agriculture and forestry should be based on a scientific assessment of land capacity.

W. Adams in his Green Development (1990) argued that Our Common Future showed greater awareness of the real world of economics and politics. However, it did not come close to explaining how that system works.

Following Brundtland we may describe the requirements of sustainable development as follows:

- A political system that allows citizens to take a full part in decision making.

- An economic system that can produce surpluses and technical knowledge on an independent and sustained basis.
- A social system offering resolutions to the tensions arising from uneven and disjointed development.
- A technological system that can search continuously for new solutions.
- An international system that fosters sustainable patterns of trade and commercial relations.
- An administrative system characterised by flexibility and the capacity for self-correction. (See Brundtland,1987, p. 65.)

In the 1980s the term 'sustainability', popularised by Brundtland's report, became current at the local, regional, national, and international level, where the ideas and principles of sustainable development were emphasised in the World Conservation Strategy (WCS) of 1980 produced by the International Union for the Conservation of Natural Resources (IUCN) and financed by the World Wildlife Fund for Nature (WWF) and the United Nations Environment Programme (UNEP).

The WCS identifies three objectives for conservation, as shown in Table 2.2.

The WCS emphasises that conservation can contribute to development objectives, and it suggests that development, conversely, can be a major means of achieving conservation. The phrase 'sustainable development' has gained currency as highlighting this symbiotic relationship between conservation and development.

2.2.2 Sustainable Development and Planning Principles and Instruments

A further joint report by IUCN, UNEP and WWF (1991) has introduced nine principles for a sustainable society within a strategy for sustainable living. These are:

1. Respect and care for community of life. This is a general principle reflecting the duty of care for other people and other forms of life, both now and in the future. Development should not be at the expense of future generations, whether human generations or animal and plant generations. Development is a means and life an end. Development, then, cannot be supported where it threatens the very thing it is intended to sustain and enrich.

2. Improve the quality of human life. This is a specific form of the first point above. Within a general concern for all forms of life, the more particular aim of development is to improve the quality of human life. Economic growth is an important component of development, but it cannot be a goal in itself. People's goals include such concerns as a long and healthy life, education, access to the resources needed for a decent standard of living, political freedom, guaranteed human rights, and freedom from violence.
3. Conserve the earth's vitality and diversity. Conservation-based development needs to include deliberate action to protect the structure, functions, and diversity of the world's natural systems. This requires conservation of life. Support systems, conservation of bio-diversity, and ensuring that the use of renewable resources is sustainable are demanded. Quite apart from the need to preserve vitality and diversity in order simply to sustain human existence, this preservation also enriches human life.
4. Minimise the consumption of non-renewal resources; minerals, soil, gas, and coal are effectively non-renewable. However, their life can be extended by recycling, by more economical resource utilisation, or by switching to renewable alternatives where possible.
5. Keep within the earth's carrying capacity. Policies that keep human numbers and life-styles in balance with nature's capacity must be developed alongside technologies that enhance that capacity by careful management. In other words, global catastrophe will result if there are too many people to be supported by the earth's resources.
6. Change personal attitudes and practice. To adopt an ethic for sustainable living people must re-examine their values and their behaviour. Society must promote values that support the new ethic and discourage those that are incompatible with a sustainable way of life. Individuals and small groups must take responsibility, as well as national and international bodies.
7. Enable communities to care for their environment. This is an expansion of the report's previous point. Communities and citizens' groups provide the most readily accessible means for people to take environmentally useful action at a local level, as well as to express their concerns.
8. Provide a national programme for integrating development and conservation. A national programme for achieving sustainability should involve all interests and seek to anticipate and prevent problems before they arise. It must be flexible, continually redirecting its course in response to experience and to new requirements.

A. Ecological Processes
1. Reserve good cropland for crops (para 5.1).
2. Manage good cropland to high and ecologically sound standards (para 5.3).
3. Ensure that the principal management goal for watershed forests and pastures is protection of the watershed (para 5.4).
4. Ensure that the principal management goal for coastal wetlands is the maintenance of the processes on which the fisheries depend (para 5.6).
5. Control the discharge of pollutants (para 5.8).

B. Genetic Diversity
1. Prevent the extinction of species (para 6.1).
2. Preserve as many kinds as possible of crop plants, forage plants, timber trees, livestock, animals for aquaculture, microbes and other domestic organisms and their wild relatives (para 6.4).
3. Ensure on-site preservation programmes protect
- the wild relatives of economically valuable and other useful plants and animals and their habitats
- the habitats of threatened and unique species
- unique ecosystems
- representative samples of ecosystem types (para 6.8).
4. Determine the size, distribution and management of protected areas on the basis of needs of the ecosystems and the plant and animal communities they are intended to protect (para 6.10).
5. Co-ordinate national and international protected area programmes (para 6.12).

C. Sustainable Utilisation
1. Determine the productive capacities of exploited species and ecosystems and ensure that utilisation does not exceed those capacities (para 7.1).
2. Adopt conservation management objectives for the utilisation of species and ecosystems (para7.2).
3. Ensure that access to a resource does not exceed the resource's capacity to sustain exploitation (para 7.3).
4. Reduce excessive yields to sustainable levels (para 7.4).
5. Reduce incidental take as much as possible (para 7.5).
6. Equip subsistence communities to utilise resources sustainability (para 7.6).
7. Maintain the habitats of resource species (para 7.7).
8. Regulate international trade in wild animals and plants (para 7.8).
9. Allocate timber concessions with care and manage them to high standards (para 7.9).
10. Limit firewood consumption to sustainable levels (para 7.10).
11. Regulate the stocking of grazing lands to maintain the long term productivity of plants and animals (para 7.11).
12. Utilise indigenous wild herbivores, alone or with livestock, where domestic stock alone would degrade the environment (para 7.12).

Table 2.2. Priority requirements of the WCS.
Source: Adams (1990) p.44.

9 Create a global alliance. No nation today is self-sufficient, and economic or industrial activity in one country may have environmental consequences in another (e.g. the acid rain effect). If we are to achieve global sustainability a

working co-operation, based on the recognition of inter-dependability, must be established internationally (Partidario, 1992).

Although this report introduced its ideas and principles under nine headings, these can perhaps be reduced to a smaller number of substantive points: development should be seen as a means to the sustenance and improvement of human life rather than as a goal in itself; the quality of human life depends on the preservation of the vitality and diversity of all life; the earth's resources - including resources still to be discovered or developed - have to be used more efficiently; action, which needs a change of attitudes at all levels, must be local, national, and international. The report also introduced the ways of achieving the aims and objectives embodied in its ideas and principles.

The WCED organised a series of international conferences concerning the relations between environment and development. The most notable was the 1992 United Nations Conference on Environment and Development (UNCED), known as the Earth Summit, which took place in Rio de Janeiro. 154 countries signed the Rio declaration on environment and development on three areas, indicated by R. Therivel et al. in their 1992 publication Strategic Environmental Assessment:

> (a) The Rio declaration, which calls for eradicating poverty world wide. It introduces the principle that those who pollute (rich countries) should pay for the clean up, and help poor countries develop their standards of living in environmentally sound ways.
>
> (b) Agenda 21, which is a comprehensive programme of action to be carried out between now and the year 2000. It covers development and environment issues. It includes measures to cut energy use, protect ocean resources, promote sustainable agriculture, and control toxic waste.

> (c) The statement of principles on forests, which is about management, conservation, and sustainable development of all types of forests. (p. 25)

The Rio declaration on environment and development sets out 27 general principles for achieving sustainable development, and Agenda 21 is a comprehensive action plan with 40 chapters of recommendations for the pursuit of sustainable development in the next century.

The comprehensive action plan consists of social, economic, and environmental dimensions. One of the environmental actions is adopting methods to assess the long and short term impacts of development, such as EA to minimise the adverse impacts on the environment.

Following Agenda 21, many national governments and international organisations have been developing concepts and guidelines on environmental considerations in planning, policies, and programmes (e.g. the UK government introduced its Planning Policy Guidance (PPG) and the environmental appraisal of development plans. This includes the methodology of how to achieve sustainable development.) (See Hashim, 1994.)

As far as sustainable development and planning are concerned, in 1993 the Town and Country Planning Association (TCPA) of the UK introduced a report called Planning for a Sustainable Environment that defined the aim of sustainable development as follows:

> To promote development that enhances the natural and built environment in ways that are compatible with
>
> 1. the requirement of conserving the stock of natural assets,
>
> 2. avoiding damage to the capacity of the world's natural ecosystems,
>
> 3. the need to achieve greater social equality, and
>
> 4. the avoidance of the imposition of added costs or risks on succeeding generations. (p. 6)

In addition the TCPA (1993) report identified five fundamental goals that should guide all decisions to achieve sustainable development. These five goals are stated as follows:-

- Resource conservation, where its goal is to ensure the supply of natural resources for present and future generations. This encompasses the efficient use of land, less wasteful use of non-renewable resources, their substitution by renewable resources wherever possible, and maintenance of biological diversity.
- Built development, where its goal is to ensure that the development and use of the built environment respects and is in harmony with the natural environment, and that the relationship between the two is designed to be one of balance and mutual enhancement.
- Environmental quality, where its goal is to prevent or reduce processes that degrade or pollute the environment, to protect the regenerative capacity of ecosystems, and to prevent developments that are detrimental to human health or that diminish the quality of life.
- Social equality, where its goal is to prevent any development that increases the gap between rich and poor, and to discourage development that produces social inequality.
- Political participation, where its goal is to change values, attitudes, and behaviour by encouraging increased participation in political decision making and in initiating environmental improvements at all levels from the local community upwards p. (178).

The aims and goals of sustainable development strategies indicated above are orientated to a development that maintains the productivity variety of nature and concentrates on improving the human condition, and more specifically provides a sustainable society. (See Partidario, 1992, and Hashim, 1994.)

Therivel et al. (1992) have pointed out that sustainable development can be realised in the form of carrying capacities, which is a function of a number of variables:

- the region in question, e.g. a watershed,
- the type of resource in question, e.g. water, energy, or whatever resource would limit the growth of the human population,
- what is being 'carried', e.g. human population, noxious gas emissions,

- whether the resource is assumed to be constant or is changing over time, and whether it is renewable or not,
- whether what is being 'carried' is assumed to be constant or not, and
- value judgements, e.g. ideal/optimum capacity versus maximum/minimum capacity.

In addition, in order to ensure sustainability, carrying capacities should not be exceeded, and to ensure that carrying capacity is not exceeded the existing state of the resources and their uses must be monitored. Predictions of the future state of the resource and its uses must be made, consideration must be given to the possible use of alternatives, and mitigation measures must be made available for implementation if the uses exceed the carrying capacity. This is the essence of SEA. (See Therivel et al.,1992).

P. Selman (1996) in Local Sustainability: Managing and Planning Ecologically Sound Places identifies three fundamental principles of sustainable development: the principle of futurity, the principle of intra-generational equity (social justice), and the principle of transfrontier responsibility.

According to Selman the principle of futurity implies that one generation should hand on the earth to the next generation in a condition at least as good as it inherited it. The principle of intra-generational equity requires that sustainable development gives primary consideration to human needs through the recognition that all people currently alive have an equal right to benefit from the use of resources, both within and between countries. The principle of transfrontier responsibility states that sustainability in one locality, region, or country cannot be achieved at the expense of environmental conditions elsewhere, and responsibility must be accepted for the impact of human activities on the natural resource stock in other areas. (See Selman, 1996, p. 11.)

In addition Selman has proposed practical guidelines for local sustainability and they are the following:

- The public trust doctrine, which places a duty on the state to hold environmental resources on trust for the benefit of the public.

- The precautionary principle, which holds that where there are threats of serious or irreversible damage cost-effective measures to prevent environmental degradation should be implemented before full scientific certainty.
- The subsidiary principle, which deems that decisions should be made by the communities affected by the authorities closest to them.
- The 'polluter pays' principle, which requires that the costs of environmental damage should be borne by those who cause it; this may include consideration of the damage occurring at each stage of the life cycle of a project or product. (See Selman, 1996, p. 15).

Type of legal/policy instrument	Examples of approach
Demand management	- Development plans and other land allocation mechanisms. - Economic incentives, charges, and taxes to reduce resource use (e.g. incentives for recycling, levying supplementary charges on road users in congested urban areas). - Regulatory powers (e.g. enforcement of fixed pollution standards). - Physical management techniques (e.g. traffic calming).
Control of land use change	- Environmental assessment of proposed new projects.
Environmental information provision	- Corporate environmental audits. - State of environment reports.
Internationalisation of environmental costs	- Pricing mechanisms to mitigate damage or compensate sufferers (e.g. polluter/user pays) through, e.g., carbon taxes.
Primary environmental care	- Direct community action. - Changing individual behaviour.

Table 2.3. The main instruments for sustainable development and practice.
Source: Selman (1996) p. 17.

Selman has further maintained that instruments for sustainable development policy and practice vary in relation to the extent to which they apply to national and local

levels. The main instruments for sustainable development policy and practice are those shown in Table 2.3.

The various strategies, principles, and guidelines of sustainable development explained in this chapter need to be achieved through workable instruments. Hashim (1994) has indicated instruments for environmental action, which can be grouped as follows:

Planning. The national socio-economic development plan should include and explain its national environmental objectives, and should incorporate an allocation of investment resources which reflects a sensitivity to environmental constraints and objectives.

Assessment. Sectoral ministries should apply environmental impact assessment (EIA) and cost-benefit analyses in decision making on development policies, plans, programmes, and projects.

Legislation and environmental law. There should be programmes to increase public awareness of and participation in environmental protection, and improvement both among voluntary action groups at community level, and among national and global non-governmental organisations.

Institutions. Government institutions should have explicit responsibility and accountability for sustainable development and environmental protection within their sectors. Their policies, functions, structures, and budgetary allocations should be made consistent with this to ensure that environmental objectives are met and sustainable development is achieved. (See Hashim, 1994, pp. 37-39.)

Jacobs (1991) outlines four instruments for environmental protection, which environmental plans need in order to be implemented; these are:

1. Voluntary mechanisms: defined as actions by individuals, groups and firms to protect the environment.
2. Regulation: a large number of environmental protection measures come under the category of regulations. They come in a variety of forms and with enormous scope. Some can be exercised through the planning system, such as land use control and building codes. Environmental assessment, and efficiency and pollution control standards are also examples of such regulations.

3. Government expenditure: the action taken directly by government, where the government is the responsible body for environmental protection related to direct and indirect provision of public services.
4. Financial incentives: associated with the techniques taken to make environmentally negative activities less attractive by making them more expensive; they are three type, taxes, tradable permits and refundable deposits. These can be used to protect the environment from the pollution made by the industries and businesses activities.

As far as the basic principles of sustainable development are concerned we may note the following points highlighted in Action for sustainability (1998):

- Decisions should be based on the best possible scientific information and risk analysis.
- Precautionary action may be needed where there is uncertainty and potential serious risk.
- Ecological impacts must be considered, particularly where resources are non-renewable or effects may be irreversible.
- The principle of 'polluter pays' requires that the cost implications be brought home directly to those responsible.
- Economic, environmental, and social issues are mutually interdependent.
- There should be equity between generations and between people and communities.
- The earth is a finite resource which needs to be understood as global and local environmental capital.
- The quality of human life involves social, cultural, political, and spiritual as well as economic development.
- All sections of the community need to engage in understanding, decision making, and action p (40).

The land use planning system can help to move towards environmentally sustainable development as a commitment to sustainability requires important changes to planning practice. Instead of the environment being a residual in planning decisions we should be choosing the environmental standards we need for the future and using planning to achieve them. In 1993 the Council for the Protection of Rural England

(Jacobs,1993) presented a report which proposed six principles of sustainable planning and four steps to sustainable planning by which these principles can be carried out:

1. Planning should be environment-led. The planning system should endeavour to make certain that society lives within the capacity of the environment to provide for it. It is the environment which provides the source of and context for economic and social development so that its protection and improvement must therefore be a primary objective of planning policy.
2. Planning should manage land use change and development in ways which improve the environment without doing unnecessary damage. Where damage is unavoidable and there are no acceptable alternatives planning should seek to keep adverse environmental impacts to a minimum. The environment should be given greater importance in all planning decisions.
3. Planning should be objectives-led. Objectives should express strategic directions and be aimed at specific environmental characteristics, both quantitative and qualitative. Through these stated objectives development plans should set out an intended 'minimum' or range of states of the environment. Objectives should be determined through an open and publicly answerable process.
4. Planning should not always 'balance' the benefits of development against the costs to the environment. Planning should define environmental capacities and prevent them being breached. To sustain such capacity limits, some developments should be ruled out whatever their current benefits.
5. Planning should become 'supply-limited' rather than 'demand-driven'. Where the supply of environmental reserves must be limited to ensure agreed objectives are met and capacities are not breached, planning should contribute to the management of demand.
6. Planning should be concerned with the totality of its impacts on the environment, including the 'direct controls' it has over development and the 'external effects' of its decisions on the environment in general. It should take particular note of effects occurring outside the area of the local authority concerned, and of secondary effects or of potential future secondary effects. (Jacobs, 1993).

The four steps to sustainable planning are:

1-Auditing the environment. An essential basis of any attempt to plan for sustainability is an appreciation of the local environment. The important kinds of information relate to trends in environmental quality, conditions, and character, crucial environmental problems, and significant pressures on different aspects of the environment. 2- Setting objectives. Environmental objectives can be of two main kinds: directional (seeking to give an impetus to trends in certain directions, with no particular end-points), and qualitative (seeking to protect or improve a more indefinite, unquantifiable 'character'). 3-Implementation. We can only move towards sustainability if we put into operation its principles on the ground. Key requirements to implement sustainable planning include sufficient resourcing, member briefing, staff training, the use of environmental management systems (responsibilities and procedures).the integration of policy with other agencies and between other planning tiers, the monitoring of planning decisions and environmental quality, and reviews of policies and objectives in the light of monitoring their impact. 4-Environmental Assessment: means incorporating the environment into the formulation of PPPs and projects, as a mean of moving to achieve predetermined environmental and other objectives. (Jacobs, 1993.)

Land use planning is concerned with several factors, social, political economic, psychological, anthropological, and technological, as they relate to the use of land and resources as these influence the lives of human beings and other creatures. It is concerned with the way the land is owned, utilised, and developed. Land use planning implies the transforming of knowledge into action in the control of environmental change as well as social change, since the two are often associated. In today's world land use planning has become a part of national social and economic planning.

Environmental planning aims to protect the environmental quality through controlling the generation of pollution and segregation of activities that are environmentally incompatible (Miller, Donald and Gert De Roo, 1997).

Figure 2.1 shows the components of environmental planning, hardware, software and heartware, between which there must be an effective interaction. Hardware consists of the physical fabric and infrastructure, software comprises sets of regulations and legislation (including ethics and traditional established codes of conduct), and

heartware consists of the individual's behaviour, which determines his needs and the processes by which the individual's interaction with the surrounding environment takes place.

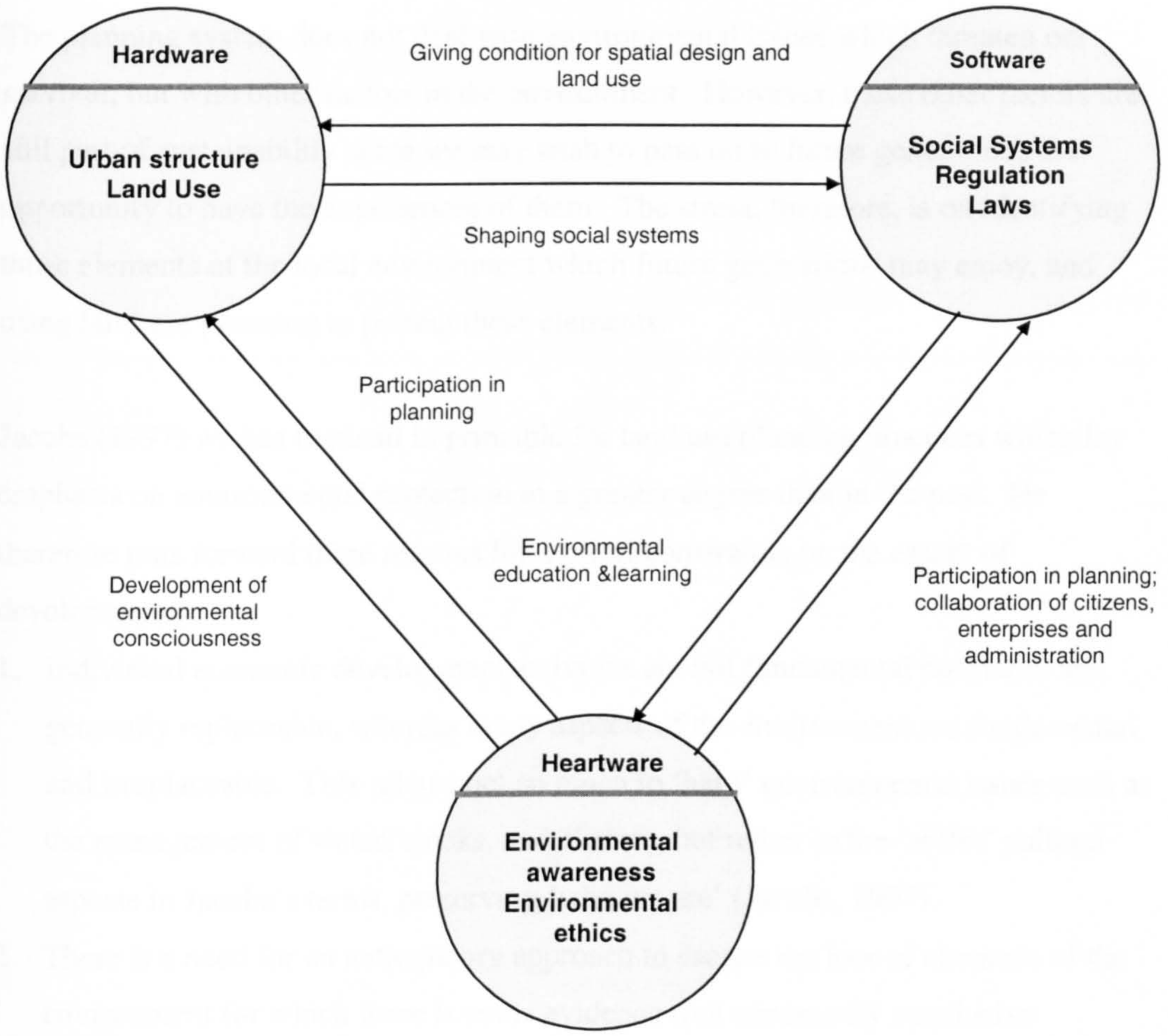

Figure 2.1 The three components of environmental planning.
Source: Harashina (1996), p.14.

Planning can be considered within a wider context of resource management, and it is more than just physical plan. Baldwin (1985) describes it thus:

> . . . the transformation, distribution, and disposal of resources in manner capable of sustaining human activities with a minimum disruption of physical, ecological, and social processes. (p.4)

In connection with this Munro et al. (1996) describe planning as

> a set of activities and procedures, properly seen as integral elements of the development process, aimed at ensuring that development activities affecting the environment:

> -provide net benefits to society
> -are sustainable
> -allow for the continuation of valuable non-consumptive uses of ecosystems. (p1)

The planning system does not deal with environmental issues which threaten our survival, but with other factors in the environment. However, these other factors are still part of sustainability since we may wish to pass on to future generations the opportunity to have the experiences of them. The stress, therefore, is on identifying those elements of the local environment which future generations may enjoy, and using land use planning to protect these elements.

Jacobs (1997) wishes to plead in principle for land use planning practices which lay emphasis on environmental protection to a greater degree than in the past. He therefore puts forward three reasons for a priori constraints on the extent of development:

1. Individual economic development activities are not fundamental but rather are generally replaceable, whereas many aspects of the environment are fundamental and irreplaceable. This relates not so much to 'hard' environmental issues such as the management of water, stocks, and climate, but rather to the 'softer' cultural aspects in Jacobs's terms, preserving 'who we are' (Jacobs, 1997).
2. There is a need for an anticipatory approach to escape the loss of elements of the environment for which there is some evidence (not necessarily conclusive evidence) that they are likely to be significant.
3. There is a need for a move towards demand management and away from seeking simply to meet demand with a ready supply in order to develop a more sustainable approach to resource use and development.

It is generally agreed that pursuing both the environmental and equity aspects of sustainable development requires substantial change in the shape that development, including physical development, takes. Of crucial importance is the direction of change and the role that the land use planning system can play in bringing about such change. Jacobs identifies three aspects as of significance: increasing the environmental efficiency of development; altering infrastructure provision and

management policies; and changing behaviour that is the cause of most environmental impacts associated with development.

2.3 Islam and Sustainable Development Concepts

2.3.1 Islamic Perspectives

According to Islamic law and teaching God (Allah) is the ultimate owner of the Earth and all things on it, the ultimate creator, who created everything from nothing (Al-Gilani, 1998). It states in the Qur-an:

> He who has created death and life to try you, which of you work the most good. (Qur-an, 67:2)

And another Qur-anic verse states that Allah created the universe to serve the one Lord who sustains all beings by balancing them upon each other, and who controls the miraculous cycle of life and death:

> God is that which splits the seed and the date stone, brings the living from the dead and the dead from the living: that is your God - how are you turned away? (Qur-an, 6:95)

The Qur-an states that everything in this universe is created for purpose and value and that nothing is created without these things:

> We did not create the heavens and the Earth and all between them carelessly. We did not create them but for the right ends. (Qur-an, 44:38-39)

And it states in another Qur-anic verse:

> I have only created jinns and men, that they may serve me. (Qur-an, 51:56)

2.3.2 The Relationship of Human Beings and the Environment

Within Islamic law a person's relationship with the environment is governed by certain moral principles. These begin with God's creation of human beings and the

part they were given to play upon the earth. Our universe, with all its assorted components, was created by God and the human being is a fundamental part of his deliberate and harmonious creation. But the role of men is not just to take pleasure from life and to benefit from their environment. They are expected to sustain, safeguard, and succour their fellow creatures (Al-Haliby (1997); Izzideen, (1990)). The prophet Mohammed, peace be upon him (PBUH), said:

> All creatures are God's dependants and the best among them is the one who is most useful to God's dependants.

According to Islamic law God is the supreme possessor of the earth and all things in it. While he has provided sustenance for all his creatures, he has given to men the role of *kelafah*, or trusteeship, by virtue of which we are to handle the earth's resources in accordance with his will. The Qur-an clearly describes this:

> Behold, the Lord said to the angels: I will create a viceregent on Earth. They said: Will thou place therein one who will make mischief therein and shed blood? Whilst we do celebrate thy praises and glorify thy holy (name)? He said: I know what ye know not. (Qur-an, 2:30)

The Islamic view of the man/nature relationship centres on this notion of *kelafah*. Islam teaches that the role of man on earth is that of *kalefah* of Allah (God) Almighty, that is the vicegerent or tenant or steward of the earth. Thus, although Allah has allowed man the privilege of living on the earth, he has as creator and ultimate possessor of the earth placed conditions on man's tenancy, and these include the care of his creation. The Qur-an puts it thus:

> Remember that Allah made you his viceregents after the collapse of Ad, and gave you domain in the land. He enable you to cultivate its plains, build palaces and carve up the mountains. Remember the gifts of God to you. Do not spread corruption and pollute the Earth. (Qur-an, 7:74)

And the Qur-an goes on to say:

> O people, serve Allah alone. There is no God but he. It is he who created you out of the Earth and established you therein that you may reconstruct it according to his patterns. So repent to him and seek his forgiveness. (Qur-an, 11:61)

The relationship between men and the environment is a multi-faceted one, incorporating many features in addition to his subjugation and utilisation of it. Foremost amongst them are construction and development, but a proper correlation of man to nature also includes meditation, reflection and pleasure in the Earth and its delights. We can find indications in the Qur-an that the Earth was once a place of peace and repose for mankind (Izzideen,1990):

> Is not he [best] who made the Earth a fixed abode, and placed rivers in the folds thereof, and placed firm hills therein, and hath set a barrier between the two seas? Is there any God beside Allah? Nay, but most of them know not! (Qur-an, 27:61)

The earth is described as being subservient to human beings and a receptacle or repository. The Qur-an states:

> He it is who hath made the Earth subservient to you, so walk in the paths thereof and eat of his providence. (Qur-an, 67:15)

The Qur-an further says:

> Have we not made the Earth a receptacle both for the living and the dead? (Qur-an, 77:25)

Furthermore the earth in seen in positive terms by Islam as a source of purity and a fit place for the worship of God. The prophet Mohammed said:

> The Earth is made for me [and Muslims] as a prayer place (*masjid*) and as a purifier. (cited in Izzideen, 1990, p. 194)

Joma (1991) explains the relationship between man and the environment. He writes:

> There is no reasonable need or urge for man to conquer natural forces and to subdue them by arbitrary methods. Natural forces are not alien to the reality of man. Rather the entire phenomena of the universe are part of man's being. Man himself is created from clay; thus natural elements are integrated into man's physical fabric. It is, therefore, seen as logical that to violate nature, to destroy its integrity, and to pollute its purity would amount to destroying man himself. Man, therefore, cannot survive the violation of nature. (p. 55)

The fulfilment of Islam's divine purpose as far as the relationship of man to nature is concerned demands the elimination of injustice and transgression in the world by

pursuing individual, social, and environmental harmony through perfection. This is an idea that lies at the very heart of Islamic teaching. Gulzar (1984) states:

> To uphold the divine purpose of Islam in the affairs of men and nature is to be just and to impede this purpose is to commit injustice and transgression (*zulm*, *fitna*, *fassad*). This divine purpose is the process of individual, societal and environmental progress to perfection and that ideal harmony we call Islam. Common societal manifestations of this injustice are the exploitative inequalities, suppression of freedom and thought, selfish accumulation of wealth and power, and ecological rampage as exploitation of nature without concern for consequences. (p. 117)

2.3.3 The Practice of Sustainable Development in Islamic law

Islamic teaching allows men to make use of their natural environment, but this is not something that should mean unnecessary waste. Extravagance in respect of natural resources is rejected by God. Many passages in the Qur-an stress the need to be moderate in the use of the earth's resources:

> O children of Adam! Look to your adornment at every place of worship, and eat and drink, but be not prodigal. Lo! he loveth not the prodigals. (Qur-an, 7:31)

The point about this Qur-an passage is that eating and drinking refer to the proper use of the sources needed to sustain life, and such use is not to be carried out in an uncontrolled way. The constituent elements of life need to be protected so that they can continue to be used in a sustainable way.

Al-Gilani maintains this view when he points out that Islamic teaching stresses that man's role on earth is limited and temporary. What he does and how he conducts himself during his short life will have to be accounted for on the day of judgment.

The prophet Mohammed (PBUH) advised Muslims thus:

> Work in this life as if you will live forever and work for the hereafter as if you will die tomorrow.

This advice is echoed in the Qur-an:

> Verily, the promise of Allah is true: let not them this present life deceive you nor let the chief Deceiver deceive you about Allah. (Qur-an, 13:33)

Allah, who has created the earth, has give the human race the *kelafah* of the earth, not to own it but rather to utilise it in a sustainable way and without destroying its resources. Izzideen (1990) explains that:

> Human beings are not the owners, but the maintainers of the due balance and measure which God provided for them and for the animals that live with them. (p. 144)

The Qur-an says:

> And after that he spread the Earth
> And produced therefrom water thereof and
> The pasture thereof,
> And he made fast the hills,
> A provision for you and for your cattle. (Qur-an, 79:30-33)

The Qur-an goes on to say:

> But when the great disaster cometh,
> The day when man will call to mind
> His [whole] endeavour. (Qur-an, 79:34-35)

Izzideen (1990) maintains the view that the concept of sustainable utilisation of the ecosystem may be deduced from Islam's affirmation that life is maintained with due balance in all things. As it says in the Qur-an:

> Allah knoweth that which every female beareth and that which the wombs absorb and that which they grow. And everything with him is measured. (Qur-an, 13:8)

The Qur-an also states further:

> He unto whom belongeth the sovereignty of the Heavens and the Earth, he hath chosen no son nor hath he any partner in the sovereignty. He hath created everything and hath meted out for it a measure. (Qur-an, 25:2)

The moral responsibility of human beings in their behaviour towards the Earth and their need to protect the natural environment through the balance that can be achieved

by sustainable development are stressed by Islamic teaching. The prophet Mohammed (PBUH) said:

> When doomsday comes if someone has a palm shoot in his hand he should plant it. (2)

This *hadith* (tradition of the prophet) shows how Islamic teaching rejects the destruction of the habitat and supports environmental issues. Islam endorses the protection of green areas and their preservation for the benefit of future generations. Izzideen (1990) backs this view up by explaining that this *hadith* 'encapsulates the process of development and will sustain life even if one does not anticipate any benefit from it'. (p. 194.)

Islamic teaching advocates sustainable development that not only looks after the present generation but takes thought for the needs of future generations. The story is told of Umar Ibn Al-Kattab (the *Kalefah* of the prophet Mohammed (PBUH)):

> He once saw that an old man, Khuzaymah Ibn Thabit, had neglected his land. Umar then asked what was preventing him from cultivating it. Khuzaymah explained that he was old and could be expected to die soon. Whereupon Umar insisted that he should plant it. Khuzaymah's son, who narrated the story, added that his father and Umar planted the uncultivated land together. (cited in Izzideen, 1990, p.195)

The prophet Mohammed (PBUH) says:

> Muslims are to hold in common these three things: water, pasture, and fire. (cited in Llewellyn, 1992, p. 1)

The right to benefit from natural resources such as water, woodland, range areas, is in the Islamic understanding a right shared by all human beings, and the abuse of such rights is prohibited under Islamic law. Llewellyn (1992) writes:

> Every member of society is entitled to benefit from a common resource to the extent of his need, so long as he does not violate, infringe, or obstruct the equal rights of other members. The user is also held accountable. In return for profiting from a renewable natural resource he is obliged to maintain its value. If he causes its destruction, impairment, or degradation he is held liable to the extent of repairing the damage, for he has violated the rights of every member of society. (p. 2)

Of interest to the Islamic attitude to the natural environment is the case of the city of Madina, where the prophet (PBUH) established the Islamic state. Madina had always been an agricultural city. Its people owned land and occupied themselves with farming and gardening. Aware that agriculture had always been the cornerstone of a prosperous economy in many civilisations, the prophet (PBUH) encouraged this activity and established rules for bringing new areas under cultivation. In one of this *hadith* he stated:

> The seed which a Muslim grows and is eaten up is a pious spending (*sadaya*). That which is stolen from it is a pious spending. That which is eaten up by the beasts or birds is a pious spending. (cited by Joma, 1991, p. 106)

The prophet (PBUH) was against the unlimited occupation of large tracts of land and using them as a means of exploitation of fellow human beings. It is stated that he once looked at a heap of agricultural tools and commented:

> A house which has an abundance of these implements brings in humility. (cited by Joma, 1991, p. 108)

Thus the prophet (PBUH) appeared to be firmly opposed to the monopolisation of land resources by huge landowners and their exploitation of more humble land dwellers and tenants.

2.3.4 The Institution of *Shariah* and its Implications for the Environment and Planning

As well as having had a decisive influence in forming the character of individual Muslims and of communities, Islam has had a great part in the policy making of Muslim states. In these states there are several institutions dealing with environmental and planning issues (Izzideen,1990).

Al-Gilani (1998) gives an account of the institutions that have existed in Muslim countries since the sixth century. In more recent times, however, with the rise in secular government and institutional structures, these establishments have become fewer in many lands.

The following are some important institutions which can aid in reaching the objectives of Islamic law and its implications for environment and planning (Joma, (1991):

1. *Ihya* (land reclamation or land development). This refers to acquiring unowned land through reclamation. The fundamental meaning of the word in Arabic is derived from the word for water, which has life-giving force. The Qur-an says:

> And God sends down rain from the skies and gives therewith life to the Earth after its death. Verily this is a sign for those who listen. (Qur-an, 16:65)

Llewellyn (1982) explains that, according to Islamic teaching, anyone who cultivates neglected uncultivated land that belongs to nobody [will own it]. The *Kalefah* Omar said:

> Whoever cultivates uncultivated land (belonging to nobody) will possess it. Umar and Ibn Auf narrated the same from the prophet (PBUH), adding . . . provided that the land does not belong to any Muslim; otherwise one has no right to plant anything in it oppressively. (cited in Llewellyn, 1982, p. 14)

Nowadays *ihya* is used by the Saudi government to encourage nomads to establish permanent residence. One example of this is the HARAD project for the rehabilitation of nomads, a project which started in some of the desert areas of Saudi Arabia.

2. *Iqta* (land grants). Most of the principles of *ihya* apply to *iqta*. *Iqta* is in fact a state grant to cultivators and developers who are entrusted with the *ihya* or reclamation of an area (Llewellyn, 1982, p. 15). It was initially the prophet (PBUH) and his four *Kalefahs* (Abu Bakr, Omar Bin Al-Khattab, Othaman, and Ali Bin Aby Talib) who applied *iqta*.

In various *hadith* it is recounted that the prophet (PBUH) granted lands to his associates and companions in the Muslim communities, for instance the area in Khaiber near Madina, which he gave to Al-Zubair, which was planted with date palms and trees (Ibn-Sallam, 1975).

Ibn-Sallam (1975) is of the opinion that the granting of lands was something that was first done to help new converts to Islam to develop some land in order to satisfy their needs. *Iqta* is bound by three conditions:

A. *Iqta* does not confer life ownership of land unless specified otherwise in the deed of *iqta*. This is to ensure that the land granted by *iqta* does not become hereditary.

B. *Iqta* should not result in development which is in any way harmful to the interest of the community. Such an *iqta* might involve the granting of rights over a watercourse or a mineral ore. This has its basis in the *hadith* of the prophet (PBUH) transmitted by Ismail Bin Ayyash:

> Hammal Al-Mazini asked the prophet (PBUH) to grant him Al-Milh in Maarib (Yemen). The prophet (PBUH) did so. When Hammal went away, the prophet was told by his companions that he granted him (Hammal) a metal ore of salt; the prophet (PBUH) then withheld his *iqta*. (p. 350, 35)

C. The development of *iqta* should be started within a period of three years dating from the day of the original grant.

Nowadays *iqta* is widely used by the Saudi government to allot land for housing and for commercial purposes in order to encourage private development initiatives.

3. *Ijarah* (land leases). This refers to the leasing of land by private owners or of state-owned land for cultivation. The land owner may specify in the lease the kind of crops to be cultivated, the rental fee, the duration of the lease, and the intended use. (Llewellyn, 1982, p. 15)

Ijarah has been practised since the earliest days of Islam. The Qur-an says:

> They found there a wall on the point of falling, but he set it up straight. (Moses) said: 'If thou hadst wished, surely thou couldst have exacted some recompense for it'. (Qur-an, 18:77)

It is the view of Llewellyn (1982) that *ijarah* has been successful in many ways, for example in managing ecologically sensitive areas like aquifers, highly erodible or disturbed lands, and saline soils. Areas such as those, if unoccupied, should be taken

over by the government and used for the welfare of the people. Areas of high ecological importance or other sensitive places which happen to be privately owned should be taken over by the state and due compensation paid. Some of this appropriated land can then be freed by the state for individuals to cultivate or use in some other suitable way.

Within Saudi Arabia *ijarah* is exercised by such bodies as the municipalities of different cities to let shops and other commercial holdings, for example vegetable and fish markets, for some public parks and for land to be used by investors in the private sector.

4. *Haram* (protected zone). Islamic law assigns the status of inviolable or protected zones to certain areas. Within these zones developments are banned or subject to limitations in order to protect utilities and natural resources from damage or loss. Jaber Ibn Abdullah has reported that the prophet (PBUH) said:

> It is Haram (Al Madinah) that is the area between the two lavas; it is not allowed to cut its trees, except to feed animals. (cited in Al-Gilani, 1998, p. 18))

In broad terms the idea of *haram* is to restrict development in areas which are particularly susceptible to damage by it. Typically *haram* zones are areas with considerable resources of great value both to individuals and society as a whole. The *haram* of a well, if it is a private well, belongs to its owner, and that of a public well to the people. In both cases the *haram* is intended to protect the well and aquifer from pollution or damage. The *haram* is also used to supply space for the management of the well, and may even help to provide watering and rest areas for livestock as well as irrigation facilities. *Haram* is also currently used in Saudi Arabia to control both private and public development of coastlines.

5. *Hema*. This refers to land that is specially reserved for purposes related to the public good, and acts as a controlling factor in the amount to which utilisation of natural resources takes place. The prophet Mohammed (PBUH) established a *hema* in Al-Fiqrah, a mountain region near Madina, where shrubs and trees were protected largely because of honey production. *Hema* was also made use of by Omar Bin Al-

Khattab to reserve land for cattle, sheep and camels.

Currently *hema* operates in Saudi Arabia in the following ways:

A. Reserves in which grazing is prohibited (e.g Hema Bani Sar near Baha).

B. Reserves for forest trees where woodcutting is banned or restricted. The cutting of trees is permitted only in emergencies or in cases of great need like the rebuilding of a house destroyed by misfortune or for the building of a mosque or school. Sometimes wood may be sold for the benefit of the community (e.g. Hema Onaiza in the Najd plateau).

C. Reserves in which grazing is restricted to certain seasons (e.g. Hema Elazahra, Hema Hameed around Be'qurashi).

D. Reserves restricted to certain species and to certain numbers of livestock (e.g. Hema Thamala near Taif).

E. Reserves for beekeeping, in which grazing is prohibited during flowering (e.g. Hema Hojra in Bani Malik Region).

F. Reserves managed for the welfare of a particular village or tribe (Joma, 1991).

6. *Waqf.* This is land given charitably for the public good (Al-Gilani, 1998). *Waqf* is unique to *shariah.* It is dedicated to various beneficial uses, such as the provision of residential, education or health facilities, and has been in effect since the dawn of Islam. It is practised in most of Saudi Arabia.

The idea of *waqf* is that it protects certain land or property from a change of function or purpose of usufruct and from fragmentation as a result of the Islamic inheritance process. Properties protected by *waqf* cannot be sold, donated or mortgaged, though they may be held as a land trust (Llewellyn, 1982).

Charity is encouraged by Islamic law. It states in the Qur-an:

> They will ask thee what they shall bestow in alms. Say: let the good which ye bestow be parents, and kindred, and orphans, and the poor, and the strangers; and whatsoever good ye do, of a truth God knoweth. (Qur-an, 2:211)

Llewellyn (1982) points out that *waqf* may contribute to environmental planning through many forms, such as trusts and endowments set up to maintain

agricultural research stations and experimental farms, training institutes, range experimental stations, wildlife breeding farms, and habitat developments.

7. *Hisbah.* This is the office of public inspection to ensure that public and private land, resources and property are put to proper use.

The essence of *hisbah* is made clear in the Qur-an, which defines and explains the role of the *muhtasib*:

> And there may spring from you a nation who invite a goodness, and enjoin right conduct and forbid indecency. Such are they who are successful. (Qur-an, 3:104)
>
> And the believers, men and women, are protecting friends of one another; they enjoin the right and forbid the wrong. (Qur-an, 9:71)

Islamic teaching and law as represented in the Qur-an and in the *Sunnah* of the prophet Mohammed (PBUH) provide Muslims with a great wealth of understanding and information in the area of sustainable development.

They sustain the prohibition of wastefulness in relation to natural resources, the protection of ecosystems, the efficient use of water and land for agricultural development, the development of unused land through *ihya*, *ijarah*, and *iqta*, and the use of *hema* and *haram* systems to protect pasture land, range land and areas around water sources such as wells and watercourses. Islamic law and teaching favours the preservation of fauna and flora and the protection of public land and property as well as private charitable endowment through the *hisbah* and *waqf* systems.

Islam teaches that Allah has promised to judge men on the day of judgement according to their actions. They will stand before him responsible for what they have done. For transgressors severe punishment in this life and on the day of judgment will be their fate, whereas rewards and paradise await those who obey the commandments of Allah.

Islamic principles stress that planning and design decisions relating to land use, crops, management approaches, should be made not merely on profit considerations or

on a whim, but that, while they should be financially viable, they ought to be positively beneficial to man and the environment.

It is quite clear from many verses in the Qur-an and from the *hadith* that Islamic law and teaching require putting a restriction on the destruction of the earth's resources that men have carried out. Islam requires the conservation and beneficial use of all natural resources, and planning for development should improve rather than diminish these resources.

Throughout the series of Five-Year Development Plans (see especially Chapter 3) the Saudi government has reaffirmed its broad objectives of sticking to Islamic principles. The first objective stated in the Sixth Development Plan states: '. . .to safeguard Islamic values by duly observing, disseminating and confirming Allah's *shariah* [God's divine law].' (MOP, 1995, p. 87)

The government plays a very important part in assessing the existing environmental, planning and agricultural policies, based on Islamic law, and in their implementation whether at a national or local level. It has to take a major lead in ensuring that further problems are recognised and avoided in relation to the environment in general terms, and especially in regard to the loss of agricultural land in oasis areas.

2.4 Strategic Environmental Assessment (SEA)

2.4.1 SEA Definitions

Strategic environmental assessment (SEA) may be described as an environmental assessment (EA) of a strategic action, policy, plan, or programme, and it should be seen as an environmental assessment tool, such as cumulative impact assessment and environment impact assessment and auditing. It is more specifically defined as the formalised, systematic, and comprehensive process of evaluating the environmental impact of a policy, plan, or programme, and their alternatives, including the preparation of a written report on the findings of that evaluation, and using the

findings in publicly accountable decision making. (See Therivel et al., 1992, pp. 19, 22.)

From the above definition, we can understand that SEA is a strong tool to evaluate the environmental impact of a policy, plan, or programme over a wide range, like other tools such as environmental impact assessment (EIA), cumulative impact assessment, or auditing.

2.4.2 The Need for and Importance of SEA

SEA is a new approach to assessing the environment, and it has been accepted and supported by many national governments and international agencies.

In 1987 the European Commission supported the desirability of extending EIA from projects to higher tiers of action. The World Conservation Strategy in 1980 pinpointed the need to integrate environmental considerations with development. The World Bank Policy in 1982 stated that environmental issues must be addressed as a part of overall economic policy rather than project by project. The Brundtland Report in 1987 stated that environmental issues must be addressed as a part of development. The heads of government of seven major industrial nations in 1989 emphasised the need to take into account environmental considerations in economic decision making. Our Common Future introduced the validity of advancing EIA as a tool for decision making for policy, plans, and programmes, and the United Nations Conference on Environment and Development (the Earth Summit) at Rio in 1992 endorsed the global concern for sustainable development, of particular relevance to SEA. It specified the integration of environment and development at the policy, planning, and management level, and specifically the adoption of comprehensive analytical procedures for the assessment of the impacts of decisions on policies, programmes, and projects. (See Wood and Djeddour, 1991, and Hashim, 1994).

Therivel et al. (1996) have introduced two reasons for the need for SEA and they are: 1) to improve the existing process of EIA; 2) to promote sustainable development. In addition they point out that there are some limitations with the existing EIA such as:

- It reacts to development proposals rather than anticipates them; that means it only allows proposals to be accepted or rejected.
- It does not consider the cumulative impacts of more than one project. In addition, the consideration of cumulative impacts in project EIA is limited by lack of information concerning development proposals and lack of control over the proposals.
- EIA only addresses alternatives to the proposed project in a limited manner. This is due to the lack of guidance and time. (In many cases project details are already drawn up with irreversible decisions taken by the time an EIA is prepared.)

In addition, Therivel et al. (1996) indicate that SEA differs from the following:

- EIA of large-scale projects because it is site specific and involves only one activity.
- 'Integrated' policy, plan, and programme (PPP) making, which incorporates environmental issues in the process and does not involve the stages of a formal EA process.
- Environmental audits or reports which do not predict the future environmental impacts resulting from the application of PPPs.
- SEA studies, which do not influence decision making.
- Many environmental strategies which do not consider a range of environmental components and do not result in a written report.
- Various integrated management plans which deal with environmental impact on a specific biotope, but do not inform decision making on alternative planning and development options which could result in sounder environmental outcomes.

Partidario (1992) has suggested that new SEAs may need to be developed based on EIA but more efficiently applied to environmentally integrated planning policy levels. PPP processes could then evolve towards more desirable sustainable approaches in the future to achieve more sustainable PPP practices.

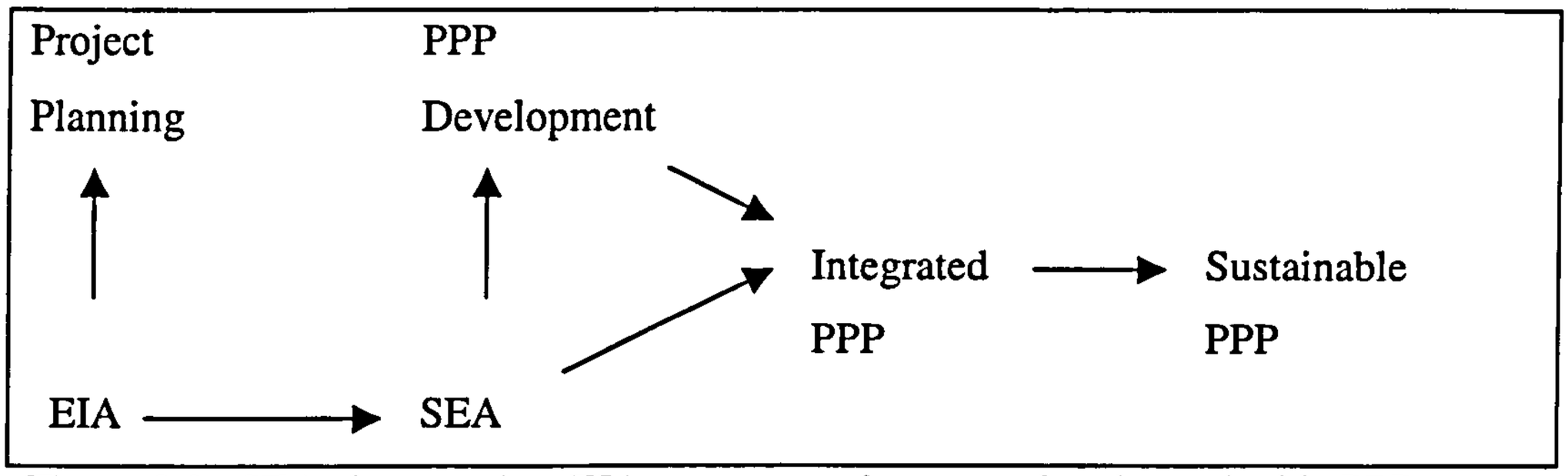

Figure 2.2. SEA: from project EIA to more environmental and sustainable PPP practices.
Source: Therivel et al., 1996, p. 10.

Finally, the further need for SEA has been summarised by Hashim (1994) as follows:

> To give equal importance to environmental concerns as to other aspects of development in decision making and to encourage decision makers to consider environmental goals simultaneously with social and economic goals, i.e. to enhance the role of environmental concerns within non-environmental organisations.
>
> To facilitate and increase consultation on environmental aspects between organisations generally involved in the formulation of PPPs, and provide the opportunity to determine the views of the general public on the nature of future developments which result from these PPPs.
>
> To reduce the number of project EAs required, either by rendering project EIA redundant if impacts have been examined sufficiently at the PPP level or by reducing the number of impacts assessed at the project level if the strategic impacts have already been addressed at the PPP levels.
>
> To facilitate the formulation of mitigation and compensation principles, which can be embodied in codes of conduct for each particular project, e.g. road construction, mountain or coastal development.
>
> To facilitate the assessment of alternatives which cannot be assessed or are difficult to assess at the project level, e.g. technology, use of resources, lifestyle, and their global impact on the environment.

> To facilitate site selections, accumulative impacts, synergistic and ancillary impacts, regional impacts, and non-project impacts, which cannot be done in project EIAs. (p.129)

2.4.3 Types and Application of SEA System

Strategic environmental assessment can be applied in three main types of action; they are:

1. Sectoral PPPs (e.g. mineral extraction, energy, tourism).
2. Area-based or comprehensive PPPs, which cover all activities in a given area (e.g. land use or development plans).
3. Actions that do not give rise to projects, but have a significant environmental impact (e.g. agricultural practices, new technologies, privatisation). (See Therivel and Partidario, 1996, and University of Manchester Department of Planning and Landscape, 1995.)

Wood and Djeddour (1991) suggest that any extension of an EIA system to higher actions should be applied to significant environmental impacts of policies, plans, and programmes relating to the various sector activities, especially agriculture, forestry, fishing, the extractive industry, the energy industry, manufacturing industry, transport, non-transport infrastructure, housing, the environment, recreation, and tourism. They add that the most appropriate plan to assess is probably neither the large area economic development plan, nor the small area local plan, but something between the two, for example a land use plan at scale of 1:25,000 to 1:500,000.

2.4.4 SEA in Various Countries

The existing uses and application of SEA systems are different from country to country because of their different policies, plans, and programmes. Reviewing the existing and proposed SEAs in different countries would give a general framework of how different countries applying the different SEA approaches in their policies, plans,

and programmes; some of these systems are summarised below, with a particular emphasis on the work done in the United Kingdom.

2.4.4.1 United States

The National Environmental Policy Act of 1969 (NEPA) in the United States sets out a national environmental policy, and to achieve this policy it requires all federal

		Sectoral and multi-sectoral actions			
Level of government	Land-use plans (SEA)	Policies (SEA)	Plans (SEA)	Programmes (SEA)	Projects (SEA)
National/ Federal	National land-use plan	National transport policy	Long-term national roads plan	5-year road building programme	Construction of motorway section
		National economic policy			
Regional/ State	Regional land-use plan		Regional strategic plan		
Sub-regional	Sub-regional land –use plan			Sub-regional investment programme	
Local	Local land-use plan				Local infrastructure project

Table 2.4. This shows an example of the level of planning at which SEAs can be used.
Source: University of Manchester Department of Planning and Landscape (1995).

agencies to prepare a detailed statement on the environmental impacts of every recommendation or report on proposals for legislation and other federal actions affecting the quality of the environment. The Council on Environmental Quality

guidelines of 1978, which interpret the requirements of the NEPA, recommend that an EIA should include a summary and table of contents, a discussion of the affected environment and alternatives, a discussion of the purpose of, and the need for, the action and possible alternatives, a list of those involved in the preparation of the work, and of organisations to whom copies of the statement are sent, and an index. In response most federal agencies established separate regulations that incorporate EIA into their programmes.

Of the American states, California has the most effective system of practising SEA. The Housing and Urban Development body (HUD) prepared a report called Areawide Environmental Impact Assessment to assess the impact of alternative patterns of urban development or redevelopment in metropolitan-scale areas.

California state requires the preparation of SEAs through the Californian Environmental Quality Act (CEQA), which requires EIA to be conducted for PPPs as well as for individual projects. About 130 programmatic environmental impact reports (PEIRs) are prepared annually. The CEQA requires public agencies to prepare SEAs for linked action including projects that are related in the following ways:

1. Geographically.
2. As logical parts in the chain of contemplated actions.
3. In connection with assurance of rules, regulations, and plans.
4. As individual activities carried out under the same authorising statutory or regulatory authority and having generally similar environmental affects which can be mitigated in similar ways.

The CEQA guidelines claim five advantages in preparing SEAs. These are:

1. They provide an occasion for understanding the considerations of impacts and alternatives.
2. They ensure considerations of cumulative impacts in a case-by-case analysis.
3. They avoid duplicative reconsideration of basic policy considerations.
4. They allow the lead agency to consider broad policy alternatives and mitigation measures at an early stage when an agency has greater flexibility to deal with accumulative impacts.

5. They allow a reduction in paperwork. (See Therivel et al., 1992.)

2.4.4.2 The Netherlands

In the Netherlands SEA has been required since 1987 for sectoral plans on drinking water supply, waste management, energy and electricity supply, and for some land use plans. The findings of these SEAs are reviewed by a special commission, and are generally subject to public consultation and commission.

The Netherlands national environmental policy plan of 1989 contained two SEA related actions; these were:

1. The first action required assessment of the existing policy areas to determine how well they fulfilled the objective of sustainable development. To implement this the government proposed a methodology which consisted of a checklist for environmental sustainable development and a list of questions to be answered in the form of a short non-mandatory document.
2. The second action required that, for policy proposals which might have important consequences for the environment, information on these effects would be provided. The implementation of this requirement is partially underway as 'action on the environment'. In the light of this requirement plans have been prepared for civil aviation sites, the drinking and industrial water supply, power supplies, waste disposal, and excavation, as well as rural plans and some regional plans.

SEA in the Netherlands is still in the process of implementation. When it is implemented it is expected to be of great interest to other countries considering establishing a sustainability-based SEA system. (See Therivel et al., 1992.)

2.4.4.3 United Kingdom

In 1990 the UK government published a white paper on the environment, This Common Inheritance, which stressed the importance of environmental considerations in development plans. This resulted in the publication of the Department of the Environment's guide Policy Appraisal and the Environment (1991), its Planning Policy Guidance – Note 12 (PPG 12) (1992), and its Environmental Appraisal of

Development Plans: A Good Practice Guide (1993). In these can be found the closest equivalent to a formal system of SEA in the UK. They provide guidelines and suggest techniques for implementing and raising some practical issues related to the organisation and presentation of environmental appraisals. These development plans and regional planning guidance material marked the beginning of environmental appraisal of local authority development plans in the UK. (See Therivel, 1994.)

There follows a more detailed look at the actions and measures taken in the UK in relation to SEA, including a review of the recommendations of these publications, in order to understand the process of implementing such a system and to understand the positive points of such implementation. Firstly, however, it is useful to indicate how environmental assessment is carried out on a day-to-day basis in the UK, in order that we can see the background against which the various proposals and requirements set out in the DoE pamphlets have to operate.

EA in the UK is mainly exercised through the town and country planning system Selman (1996). Very broadly, as far as individual projects are concerned, the EA process involves the following (Glasson et al., 1994):

- Project screening.
- Scoping (i.e. ensuring that a plan's scope covers an appropriate range of concerns).
- Consideration of alternatives to the project.
- Description of the characteristics of the project.
- Identification of key impacts.
- Prediction of impacts.
- Evaluation and assessment.
- Presentation of the overall statement of impacts.
- Review of the quality of the final statement.
- Decision making, balancing the information in the environmental statement with other material considerations.
- Post-decision monitoring of the development, if it proceeds.
- Auditing of actual outcomes against predicted outcomes, to help refine the art and science of environmental impact forecasting.

The main documentation associated with this process is referred to as the 'Environmental Statement' (ES).

Policy Appraisal and the Environment (DoE, 1991)

This pamphlet suggests a comprehensive approach. In brief, it recommends the following as the stages of EA:

- Summarise the policy issue.
- List the objectives.
- Identify the constraints.
- Specify the options.
- Identify the costs and benefits.
- Weigh up the costs and benefits.
- Test the sensitivity of the options.
- Set up any necessary monitoring.
- Evaluate the policy at a later stage.p(17)

Planning Policy Guidance Note (PPG 12) (DoE, 1992)

The government of the UK has made clear in PPG 12 its intention to work towards ensuring that development and growth are sustainable. Development plans have a key role to play in achieving this goal by ensuring that future generations are not denied the best of today's environment. PPG 12 was proposed by the government after public consultation to explain statutory provisions and provide guidance to local authorities and others on policies and the operation of the planning system.

PPG 12 covers the following:

- The type of plan (structure, local, and unitary plan).
- Plan preparation procedures.
- The content of plans.
- The format of plans.
- Detailed guidance on the environmental appraisal of plan proposals.

PPG 12 proposes the SEA system as a tool. It sets out the concept and scope of environmental appraisal. It is intended that SEA should apply to all type of plans and to all policies and proposals, that it should be part of the plan preparation process, and that it is itself a process of identifying, quantifying, weighing up, and reporting on the environmental effects of those policies and proposals.

PPG 12 requires local planning authorities to conduct an environmental appraisal of plans, policies, and proposals as they are being drawn up.

In Chapter 6 of PPG 12, 'Plans and the Environment', more detailed guidance is introduced on the environmental appraisal of plan proposals and it is suggested that local authorities should in the widest sense participate in plan preparation and should concern themselves with the analysis of the policies that form part of plan preparation.

In Chapter 6, Section 6.4, PPG 12 states:

> Land is a finite resource and we have to find enough for all our needs, home, jobs, shops, food, transport, fuel, building materials and recreation while protecting what we value most in our surroundings. Conservation and development should not be seen as necessarily in conflict; policies for land use must weigh and reconcile priorities in the public interest.

In addition, it indicates that development plans are required to include land-use policies and proposals for the improvement of the physical environment, and planning policies should also reflect coastal protection, flood defence, and land drainage issues which may influence the location of new development and the need to protect water quality.

Environmental Appraisal of Development Plans: A Good Practice Guide (DoE , 1993)

In November 1993, the UK government guidance on how to carry out environmental appraisals led to the DoE's publication Environmental Appraisal of Development Plans: A Good Practice Guide. This indicated that the purpose of environmental appraisal is:

- To clarify the environmental objectives for plans.

- To understand the implication for the environment of any policy option or interacting group of policy options.
- To enable the implication for different, wide ranging, and potentially conflicting aspects of the environment to be taken into account.
- To allow environmental matters to be considered along with economic and social factors, and to assist in making a choice between alternative policies and proposals in a way which will secure the best outcome overall.
- To demonstrate to users of the plan how the policies have regard to environmental matters.p (2)

As far as procedural matters are concerned the pamphlet recommended the following:

- The environment should be characterised through an assessment of environmental stock, which provides the baseline needed for the appraisal so that policies and proposals are considered in terms of any changes they are likely to bring about.
- The plan in question should be scoped in such a way that it embraces and covers the right and appropriate range of environmental concerns, which can be found in central government guidance.
- The plan content should be appraised. The approach recommended is applicable to all types of development plan (structure, unitary, district, minerals, waste, and national park plans) and is undertaken at a number of levels: at the level of broad strategy objectives, at the formulation of spatial strategy, which indicates how new growth is to be accommodated, and at the site selection or proposals stage when land is being allocated to specific users.

By comparison with Policy Appraisal and the Environment (1991), discussed above, this may perhaps be characterised as a minimalist approach.

The Environmental Appraisal of Development Plans (1993) is an explicit, systematic, and interactive review of development plans, policies, and proposals to evaluate their individual and combined impacts on the environment. It is an integral part of the plan making and review process, which allows for the evaluation of alternatives.

The proposed environmental appraisal of development plans is intended to be adaptable to every level of plan. In practice, it performs a number of other functions, the most important of which are:

- The output and process of the appraisal, contributing to an appropriate base for plan monitoring. This monitoring is a part of local authority work and its environmental aspects are vital to effective appraisal.
- Environmental appraisal is a learning process, which raises environmental awareness and knowledge within the plan making team and the planning department.
- Environmental appraisal is a means for introducing best environmental practice into plan making, for example with respect to developing land use or transportation strategies which minimise the number and length of journeys. (See DoE, 1993.)

The recommended approach is then to appraise the plan content in terms of its internal consistency so that development proposals accord with its overall environmental objectives and other individual policies do not inadvertently cancel out the environmental targets of other plans.

One way to check that is through a compatibility matrix, in which elements of environmental stock are arranged along one axis and on the other axis are arranged the policies, to help to present the impact of each policy option on each aspect of environmental stock. The matrix is used to record whether there is likely to be a positive, negative, or neutral impact. (See Selman, 1996.)

In summary, the UK government response to ensure that development and growth are sustainable resulted in the Department of the Environment pamphlets Policy Appraisal and the Environment (1991), Planning Policy Guidance Note (PPG 12) (1992), and the Environmental Appraisal of Development Plans : A good Practice Guide (1993), to guide local authorities in preparing their plans in a sustainable way. As explained earlier the steps for EAs which need to be followed are:

Step A. Characterise the environment by identifying components of 'environmental stock' that might be affected by development plans.

The use of the environmental stock in the appraisal enables:

- The systematic consideration of all environmental factors throughout the plan.
- Consistency across planning areas, and with other environmental information bases held by different organasitions;
- Monitoring of the plan´s effectiveness (DOE, 1993 , p8).

A recommended list of elements of stock by the DOE (1993) is the following:

Level of concern	Element of stock
Global sustainablity	Transport energy efficency Trip length Number of trips Public transport share Walking and cycling share Built environmental energy Efficiency Heat loss Capital energy Potential for combined heat and Power Solar gain Renewable energy Carbon dioxide fixing
Resource management	Air Water Land and soil Minerals Wildlife
Local environmental quality	Landscape Inhabitability Heritage Open space Building quality

Table 2.5. Recommended list of the environmental stock
Source: Urban Environmental Planning, 1997, p.285.

In drawing up the categories of the environmental stock for the appraisal there are three considerations:

1. Identifying all significant aspects of the environment on which land use plans can have an impact;
2. Distinguishing between these therefore their use in appraisal will be informative;
3. Keeping the number of components in the stock under control in order to keep the appraisal process managable (DOE, 1993).

The list can never be defintive.DOE (1993) Sources of data on environmental stock include the following:

- The planning department or section carrying out the planning function within the authority itself or in another appropriate local authority. These hold data on statutory designations, e.g. AONBs and SSSIs, designations in previous plans, e.g. areas of landscape value or areas important for mineral resources.
- Other sources in the authority, e.g. the Environmrntal Health unit as the main source of data on air quality.
- External bodies, e.g. MAFF, which holds data on quality of agricultural land, and the National Rivers Authority (NRA), which advises on all areas which influence the interests of the water environment, and the statutory conservation organisations, e.g. the Countryside Council for Wales, English Nature, and the Countryside Commission.
- Voluntary national organisations, e.g. the RSPB, which holds valuable data on aspects of environmental stock, and local groups, e.g. wildlife trusts which are able to provide expert and frequently well-catalogued information on habitats in the area p (11).

Step B. Scoping the plan, which can identify the environmental issues which require special attention. In scoping the first step is to identify the appropriate scope of the plan, and the second is to check the actual scope against the appropriate scope.

The scoping exercise can:

- provide early signs of the environmental issues which will need attention in the plan-making process;
- establish environmental issues at the core of the plan-making process;
- introduce consistency with central government policy and other relevant guidance;
- reduce any challenges to the plan on the grounds of inadequancy of environmental content;
- drawing attention to potentiial alternative policy directions;
- setting standards and targets to be used in the plan (DOE, 1993).

Step C. Appraising the plan content. The DOE (1993) proposes that the impacts of policies should be evaluated in a matrix, with the environmental criterion listed on one axis, the policies on the other axis, and the impacts of each policy on each environmental criterion described in the relevant matrix cell. In addition the appraisal of the plan content is to be undertaken at a number of levels:

- at the level of broad strategy objectives;
- at the formulation of the spatial strategy which indicates how new growth is to be accommodated and linked to transport proposals;
- at the policy development stage when policy options are being considered, selected and refined;
- at the site selection or proposals stage when land is being allocated to specific uses p.(18).

In addition the document suggest a 'compatibility matrix' designed to ensure that individual policies or clusters of policies are in line with the plan's overall objectives. Good practice pointers for setting up and using compatibility matrices are :

- it should be done reasonably quickly and used to pinpoint uncertainties or clear conflicts where further work is essential;
- a variety of symbols can be used record some degrees of conflict, reinforcement or uncertainty; compatibility does not necessarial imply mutual policy support but sometimes merely the absence of conflict;

- incompatibility may reflect several different kinds of conflict, such as competition for scarce land resources, or basic differences in purpose (DOE, 1993, p.19).

At the heart of the appraisal is the policy impact analysis, which uses a policy impact matrix with the policies on one axis and environmental criteria on the other, and where each cell in the matrix confronts one policy with one aspect of the stock. This is used to illustrate whether there is a positive, negative, or neutral impact.

In connection with this matrix there are several helpful pointers for good practice by DOE (1993):

- The stock axis of the matrix should be kept to a manageable size.
- The aspects of environmental stock in a matrix must be expressed so that the depletion or degradation of stock is always recorded as a negative impact, whilst enhancement or protection, or a move in that direction, is a positive effect.
- Impact appraisal for a given policy should be recorded on the matrix using symbols rather than any quantification.
- Only where impact is clear and significant should it be recorded; to keep the matrix simple, it is suggested that gradations impact (e.g. moderate to great) should not be recorded on the matrix itself.
- Where impact is likely, 'not certain' should be entered since it will arise from development of the policy in later proposals; this should be recorded, thereby flagging up the impact for future references.
- Impacts which are uncertain because of lack of knowledge or information must also be explicitly recorded and provide a focus for future work p (22).

The policy appraisal may be enhanced if a clear record sheet is kept of the assessment at each stage, the appraisal is likely to provide links between policies and specific land use proposals, and both are subjected to an analysis of their impact on common environmental stock. Policies selected following an impact appraisal should set a context for selection of the development sites, where a more detailed consideration of smaller of aspects of stock is necessary.

Step D. Presenting the appraisal. The appraisal process must be clear to those not involved in the process, by showing how the environment has been taken into account in the formulation of the plan and what the impact of the implementation of the plan might be. It is recommended by the DOE (1993) that the presentation of the appraisal be dealt with as follows:

- There should be explicit reference, as part of the reasoned justification or explanatory memorandum for each topic chapter and relevant policy (or group of policies), to the relevant environmental considerations taken from the environmental appraisal in determining the basis of the choice put forward.
- There should be inclusion in the plan of a chapter on the general spatial strategy and environmental considerations, making explicit how the strategy is working towards sustainablity in a consistent way. This has the advantage that the overall approach to environmental matters can be made explicit, including the intended environmental outcome of both individual policies and spatial strategy. This section should also give brief details of the appraisal process adopted and summarise the findings, for example the policy options considered, the criteria used in their comparison, and the basis for the choice put forward (DOE, 1993).

As a result some of the UK local authorities, such as Solihull Metropolitan Borough Council and Kent and Lancashire County Councils, have responded and produced their own environmental appraisal of their development plans; they used the techniques suggested by the Department of Environment and Planning Policy Guidance notes.

From this review it can be well recognised that there has been a very fast response from all the levels of the UK government with responsibilities in the field of planning and development towards sustainability. The response started at national government level and worked down to local level.

PPG 12 discusses development and sustainability, and it requires development plans to be subjected to SEA. (See PPG 12, 1992, and Therivel et al., 1992.)

The environmental appraisal of development plans provides a framework and methodology which can be used and adapted to an authority's circumstances and requirements, and it can be responded to and adapted as technical information on environmental issues developments. (See Sadler, 1996.)

2.4.4.4 Australia

At the national level there is no specific provision for SEA; however, it is under consideration as part of a public review of the EIA system. At the state level, New South Wales and Victoria have established co-ordinated project EIA and land use planning systems which incorporate SEA elements, while Western Australia has explicit provision for EA of policies, plans, and programmes. In general the experience to date is positive at the plan and programme level. (See Sadler, 1996, and Halimat, 1994.)

2.4.4.5 Canada

Under the cabinet directives of 1990 the federal government established a process of policy and programme assessment at the federal level, all agencies being required to submit to the cabinet a policy and programme proposal which assesses and documents potential environmental effects. However, to date no figures are available on the number of environmental statements and supporting analyses attached to cabinet submissions. Currently guidance on good practice in policy and programme assessment is under development by an interdepartmental committee. (See Hashim, 1994, and Sadler, 1996.)

2.4.4.6 Malaysia

The EIA system is limited to projects in Malaysia. The most comprehensive official document is the environmental quality report, which is produced annually by the Department of Environment, Malaysia. To date there is no national or state guidance on environmental considerations, environmental appraisal, and sustainable

development principles in development plans. The integration of EIA or SEA into land use planning is unknown in planning circles. (See Hashim, 1994.)

2.4.4.7 Spain

The Spanish EIA Act, implemented in 1988, includes commercial sports, marinas, pit mining, dams, expressways, and airports. The application of this act at municipal levels depends on the type of project. If the project is not on a national scale or not listed in the regulations, the act does not apply. The cumulative impacts of these projects are not addressed; national legislation does not require it. However, several autonomous regions have made EIA compulsory, establishing the need to carry it out as an integral part of their plans. (See Rivas et al., 1994.)

In 1996 Sadler introduced the following quoted scope of SEA applications from the countries and cases reviewed :

> Policy, plan, and programme focuses. Examples can be found of SEAs carried out for all levels of decision making. These include EA of broad national policy and legislative proposals. Not unexpectedly, however, the majority of formal SEAs is for sectional plans, programmes and regional development, and land use plans.
>
> Sectors and areas covered. At this level, SEA seems to be applied most often to three essential development sectors: energy, transport, and waste management. Natural resource management issues (e.g. water, forestry, agriculture, and wildlife) are moderately well represented in SEA practice. Other sectors such as tourism, housing, and settlement appear to be land use plans rather than targeted directly.
>
> Range of factors included. Most SEAs reviewed adopted a relatively broad definition of environmental considerations to include socio-economic, health, and other relevant factors. However, cumulative effects are not always addressed sufficiently, which is surprising in the light of the rationale for SEA. There were few evident examples of integrative assessment, i.e. identification of environmental, social, and economic considerations, and trade-off and policy options. The Lake Burullus case and the Australian forest and timber enquiry both demonstrate such an approach.

> Timing of assessment. Many of the examples were reportedly applied in accordance with the principle of early application of the SEA process as an integral part of policy plan or programme design including the evaluation of alternatives. Because of political or decision making circumstances, other cases were applied at a later or even post-decision stage. Although this is less than ideal, it still may be useful in guiding the implementation of policy; for example, Canada's environmental review of the North American Free Trade Agreement was applied in parallel with negotiations and is widely credited with 'greening' them and leading to the establishment of an important environmental side agreement. (pp.152,153)

2.4.5 SEA Methodologies

The methodology of the implementation and application of SEA is the same as that of EIA but with some differences in detail such as:

- The scale of an SEA tends to be greater than for an EIA.
- The time interval between the planning of an action and the implementation of the specific activities which give rise to environmental impacts is much longer in the case of SEA.
- The degree of detail and level of accuracy of information needed for policy, plan, and programme assessment is generally much less than is needed for project evaluation and decision making.
- The time available for gathering and analysing information for an SEA is, with the important exception of some policy decisions, greater than for an EIA.

However there are different methods that may be used to undertake each of the tasks in the SEA process; these are of two kinds:

1. EIA methods (e.g. impact identification methods for describing baseline conditions, predictions of pollution, impact from multiple sources), which can be adapted for strategic assessments.
2. Policy analysis and planning study methods which can be adapted for SEA (e.g. scenario and simulation analysis, site selection and land suitability analysis, policy

and programme evaluation techniques, systems modelling, goals achievement analysis, planning balance sheets approaches, cost-benefit analysis, constrained cost analysis, sensitivity analysis) and other techniques for handling uncertainty.

Rivas et al. (1994) make the point that there are two ways of linking EIA with land use planning :

1. 'EIA of plan', which is an assessment of a plan after it is prepared.
2. 'EIA in plan making', which is a dynamic interactive process occurring during the plan's preparation.

The most challenging tasks in SEA are scoping and assessment because of their wide scale and complexity and the five procedural issues of confidentiality, constitutionality, procedure deficiency, proponent-competent authority relationship, and curtailment of competencies in SEA, which are quoted from Hashim (1994):

> Confidentiality. The draft contents of certain policies (such as details of central government budget proposals), plans, and programmes, may be considered too sensitive to release for public consultation. Prior to their approval, as in the case of EIA, this may be handled by exemptions from certain consultation arrangements.
>
> Constitutional Issues. Certain actions (such as high level policy decisions) are approved by national cabinets. If these were subject to SEA law, the cabinet decisions relating to them may be subject to legal challenge in the courts. In Canada, this has been addressed by incorporating an environmental assessment procedure within federal cabinet decision making procedures.
>
> Procedural Deficiencies. SEA, to be effective, should be integrated into existing procedures at essential decision making points for PPPs. These procedures should have the potential to meet SEA requirements, relating to the provision of documentation by the proponent, for consultations in decision making by the competent authority.
>
> Proponent-Competent Authority Relationship. In certain cases the proponent belongs to the same organisation as the component authority. In the case of PPPs, this is likely to

> occur frequently. One means of safeguarding the objectivity and quality of the EIA process . . . is to submit the EIA to review by an independent environmental authority or commission. A similar kind of solution may be needed to safeguard the SEA process.
>
> Curtailment of competencies. SEA may be resisted by some government departments as into their area of competence. . . . It provides a real challenge to governments and, more particularly, departments with developmental responsibilities to give greater meaning and credibility to their role in promoting sustainable development. (pp.132,133)

2.4.6 SEA Limitations

Therivel et al. (1996) explain that SEA has technical and procedural limitations. The technical side is that SEA covers large areas. Sometimes several countries have a large number of alternatives, which makes the collection and analyses of data for SEA very complex. SEA is also subject to a greater level of uncertainty about future environmental, economic and social conditions, about development likely to take place as a result of policies, plans and programmes, and by uncertainty about likely future technologies.

On the procedural side policies, plans, and programmes are generally non-linear and complex, which makes it difficult to know when an SEA should be carried out, and what exactly the policy, plan, or programme is that is being assessed. Sometimes PPPs may be confidential.

In addition, Wood and Djeddour (1991) address the methodological limitations such as difficulties of predicting impact, lack of definition, monitoring of on-going environmental change, absence of specific SEA methods, and consultation and participation.

Finally, Therivel. et al. (1996) summarise some barriers and challenges regarding the implementation of SEA, which in most cases seem to derive from the uncertainty and vagueness associated with SEA in different countries; these are:

- Lack of knowledge and experience concerning which environmental factors to consider, what environmental impacts might arise, and how integrated policy making can be achieved.
- Difficulties of co-ordination amongst and within government departments.
- Lack of resources (information, expertise, financial).
- Difficulty in stating clear policy proposals and in defining when and how SEA should be applied.
- Methodologies not well developed.
- Limited public involvement.
- Lack of clear accountability in the application of the SEA process.
- Current EIA practices are not necessarily applicable to SEA and are inhibiting sound SEA approaches.
- Lack of guidelines to ensure full implementation. (pp.18, 19)

2.5 Summary

The concept of sustainable development has been shown to have evolved out of the growing environmental concerns of recent years and is concerned with meeting the needs of the present without jeopardising the capability of future generations to meet their own needs. The idea has developed in the last few decades and has now become a global goal at all levels - local, regional, national, and international - as has been shown in this consideration of the literature on the subject..

The main contributions of individual writers on sustainable development have been reviewed above, but it has also been addressed, as we have seen, by a number of official publications and reports from national governments and international bodies representing governments. In particular, following increasing awareness of environmental problems, many governments signed Agenda 21 after the Rio Earth

Summit. Each of those governments produced a report, relating to the Earth Summit, considering environmental protection issues.

Non-governmental organisations too, many of them international, are concerned with the environment. There have been many conferences, reports, programmes, and guidelines the aim of which is to introduce the way to achieve sustainable development, such as the report by the IUCN, the UNEP, and the WWF, which introduced the principles for a sustainable society, as well as Our Common Future by the WCED, Agenda 21, and guidelines and environmental appraisals including environmental appraisals by UK agencies. This has all resulted in strengthening the role of the EIA system and in emphasising the use of SEA as a tool to achieve sustainable development.

The importance of land use planning in attaining the goal of sustainable development has been noted, and its need to respond to environmental changes which accompany economic development. Through the planning function environmental impacts can be moderated, resources sustained, and environmentally friendly practices encouraged. The emphasis is on perceiving which elements of the environment future generations have the right to enjoy the use of, and using land use planning to safeguard them.

It has been shown how thorough and complete is the influence of Islamic teaching and law on environmental development and planning issues in Saudi Arabia. The government of Saudi Arabia has clearly and categorically based its attitude to and policies towards the environment on Islamic principles, as befits a Muslim country.

Islamic law and teaching as found in the Qur-an and the *Sunnah* of the prophet Mohammed (PBUH) have introduced the framework for men to act on the Earth, and they will be judged on how they do so. Islam places great stress on the protection of man's natural environment, emphasising that the Earth belongs to Allah its creator and that human beings have been given the trusteeship or stewardship of the world; they must preserve therefore and sustain it not only for themselves but also for succeeding generations and for all their fellow creatures. The Qur-an states:

> Do not mischief on the Earth after it has been set in order.
> (Qur-an, 7:85)

and:

> O children of Adam! Wear your beautiful apparel; at every time and place of prayer: eat and drink: but waste not by excess, for Allah loveth not the wasters. (Qur-an, 7:31)

The institution of *shariah* and the precepts and practices that develop from it have played an important part in the formulation of environmental and agricultural policies in Saudi Arabia (as in other Muslim countries), as is made explicit in the Five-Year National Plans. These precepts and systems are found manifested the approach of the Saudi Arabia government to agricultural policies, land and property ownership, and other concerns affecting development and planning today. The practice of sustainable development is not only thoroughly consistent with Islamic teaching, but is in fact encouraged by it. (This has recently been explicitly re-emphasised by HRH Prince Sultan Bin Abdulaziz Al-Saud, the Second Deputy Premier of Saudi Arabia, in a speech on 26 April 1998, where he spoke of 'sustainable development according to our Islamic and traditional values'. See also Chapter 3.) But while, in relation to the environment and natural resources, the development and planning policies and the Islamic principles on which they are based are well-founded and praiseworthy, the actual implementation of some of these policies has been somewhat inadequate and has had a negative impact on the environment as a whole, and especially on agricultural land in the country's oasis regions.

The discussion then concentrated on SEA. The literature, including both individual works and official publications, has been reviewed in order to help us understand SEA in terms of definition and the methodology of its application for environmental assessment.

We have also looked at the need for and importance of its application in different countries, with an in-depth look at the understanding and application at both national and local levels in the UK. We have also indicated the limitations of SEA and some of the obstacles that stand in the way of its effective application, some of which are methodological and some of which are perhaps more associated with a failure to grasp fully what SEA is.

The literature review of this chapter shows the importance of environmental assessment of plans, policies, and programmes as a tool in the achievement of sustainable development. The capacity of the planning system to adapt environmental assessment in its process is of paramount importance. However, this differs from country to country according to the political, social, and cultural systems.

Land use planning can link to environmental assessment in two ways: assessment of plans after they are prepared, or a dynamic interactive process occurring during the period of the preparation of plans.

Taking into consideration the limitations of the task as outlined in this chapter, such as technical and procedural constraints, the outline of the problem of this research will help to delineate the plans, policies, and programmes which relate to the loss of agricultural land in the oases in the kingdom, and help to assess the development in the oases and to assess its sustainability.

Within the limitations of the different ways and tools used to asses the plans, policies, and programmes, the aim has been to understand and draw attention to the different ways of environment assessment used or that can be used in the planning process, and the importance of assessment in reaching sustainable development.

The goal of this section has been to understand SEA as a tool which can be used for environmental assessment of a plan, policy, or programme, and to help the researcher to use this tool in the present research to apply it in land use planning in Saudi Arabia.

Notes

* Qur-anic verse. For all Qur-anic verses quoted in this thesis the English translation of the meaning and commentary of the Qur-an, published in 1990 by the Ministry of Hajj and Endowment, was used.

* *Jinn*. The Arabic word is derived from *Junna*, meaning covered or hidden. Both the Qur-an and hadith describe the *jinn* as a definite species of living being. *Jinns* are created out of fire, like man. They may believe or disbelieve.

* *Hadith*. Sayings and traditions of Mohammed which have been memorised and subsequently recorded by the companions.

* *Sunnah*. the teaching of the prophet, is the second source of the *shariah*. It demonstrates how Moslems should carry out some of the injunctions of the Holy Qur-an.

Chapter 3

The Importance of the Oases in the Kingdom, Urbanisation and Development in Saudi Arabia, the Urban and Regional Planning process in Saudi Arabia and the Impact of Urbanisation and Development

3.1 Introduction.

3.2 The Importance of the Oases in the Kingdom

3.2.1 Oases in the Kingdom

3.2.2 Geographical Location of Saudi Arabia

3.2.3 Climate

3.2.4 Geology

3.2.5 Physiographic Regions

3.2.6 Legislation in Saudi Arabia

3.3 Urbanisation and Development in Saudi Arabia

3.3.1 Population and Settlement

3.4 The Urban and Regional Planning Process and National Development Plans

3.4.1 The First Phase

3.4.2 Second Phase

3.4.2.1 The National Five Year Development Plans

3.4.2.2 The First National Development Plan

3.4.2.3 The Second National Development Plan

3.4.2.4 The Third National Development Plan

CHAPTER 3 The Importance of the Oases in the Kingdom, Urbanisation and Development in Saudi Arabia, the Urban and Regional Planning Process in Saudi Arabia, and the Impact of Urbanisation and Development

3.1 Introduction

This chapter aims to introduce the importance of oases in the Kingdom of Saudi Arabia both before and after the discovery of oil; it further aims to indicate the process of urbanisation and development which took place in Saudi Arabia, and the ensuing government intervention aimed at planning and shaping this process of urbanisation and development. Finally this chapter will deal with the impact of the urbanisation and development process on the general environment in Saudi Arabia, with a special focus on the impact on the oases in the kingdom in general. Al-Qatif oasis in particular will be investigated later in this research as a case study.

3.2 The Importance of Oases in the Kingdom

3.2.1 Oases in the Kingdom

Oases in the Kingdom of Saudi Arabia may be defined as agricultural lands located inside the desert or on the coast, containing villages, towns or cities. Typically there is a main settlement, whether a village, town, or city, located at the centre of the oasis, with satellite settlements scattered within or around the oasis. The oases have been, and still are, the main source of a variety of crops and vegetables, especially dates (the dominant plant is the palm tree) for the whole kingdom.

There are many such oases in Saudi Arabia, scattered in the east, the west, the northwest, and the centre of the country. Amongst the most important oases are Al-Hasa, Al-Qatif, Madinah , Al-Kharj, and Al-Qasim.

Before the discovery of oil these oases played a vital role in the life of Saudi Arabia. Since it was in those locations that water and land that could be cultivated were found, they were capable of sustaining life. They also had the advantage of a cooler, more tolerable climate in an otherwise hot country. Their resources meant that they had experienced considerable agricultural development, able to provide a wide range of products, and they became the main centres of population. Some oases, such as Al-Hasa and Al-Qatif, have a large number of settlements located within them; others, like Al-Kharj and Madinah, have rather fewer.

The settlements themselves have developed according to different patterns. In Al-Qatif and Al-Hasa oases, for example, settlements have developed inside the borders of the oasis area and are surrounded by agricultural lands. In other oases, such as Al-Kharj, settlements have grown outside the oasis itself, or have expanded to its outer edges. Developments of this latter type owe their existence to the discovery of oil in the Eastern Province of Saudi Arabia in the 1930s. This discovery meant major changes in the province's economy, in the settlement pattern of its oases, and in its social life. These changes, unfortunately, have not always been for the better.

A full analysis of the impact of the urbanisation and development process will be made later in this chapter. Firstly we will look at the process itself, how it relates to the areas of Saudi Arabia where oases are found, and the effect on the oasis areas.

3.2.2 Geographical Location of Saudi Arabia

The Kingdom of Saudi Arabia is located at the southwest end of the Asian continent, at the crossroads between Asia, Africa, and Europe. It is bordered to the north by Jordan, Iraq, and Kuwait, to the south by Yemen, to the east by the Arabian Gulf, and to the west by the Red Sea.

As the largest country in the Arabian peninsula, the Kingdom of Saudi Arabia has an area of two and a half million square kilometres, approximately eighty percent of the peninsula. The country has a population of 16,939,294, of which 12,304,830 are Saudi Nationals, spread throughout the kingdom as shown in Figure 3.3. (See Central

Department of Statistics, 1993; Ministry of Information and Foreign Information, Information Report, 1994; World Architecture, 1996.)

3.2.3 Climate

The climate of Saudi Arabia varies with the varying topography of the country, as well as with the seasons. The mean summer temperature (June to August) ranges from 23°c to 35°c, and can reach 48°c in the interior regions. In winter (December to February) the mean temperature ranges from 8°c to 27°c, and can fall to 0°c in the northern interior regions. During the summer months the humidity is less than 25% in the inland areas, while in coastal areas the mean ranges from 50% to 60 %. In winter coastal humidity generally ranges from 60% to 70%, and it rises to around 50% in inland areas. At certain periods, however, humidity can reach 90% in some coastal stretches.

There is a wide variation in Saudi Arabia's rainfall patterns. In general the mean annual rainfall is 120 mm, but it can be as high as 400 mm in some southwestern highland regions, as shown in Figure 3.2. March and April are the months which see the greatest precipitation. Though hailstones and frost can be experienced in some parts of the kingdom, snow is rare (Ministry of Information and Foreign Information, Information Report, 1994).

The prevailing wind is westerly or southwesterly during the Saudi winter, and this changes to easterly and northeasterly from early summer to mid-autumn. Wind speeds reach their greatest in the winter months of December to March, and start to diminish in the spring. Average monthly wind speed is in the 12 km/hour to 15 km/hour range.

3.2.4 Geology

The Arabian peninsula is a huge crustal plate divided into the Arabian Shield and the Arabian Shelf. The shield is an ancient land mass, part of the Nubo-Arab shield complex. It is composed of igneous and metamorphic rocks of pre-Cambrian age. It

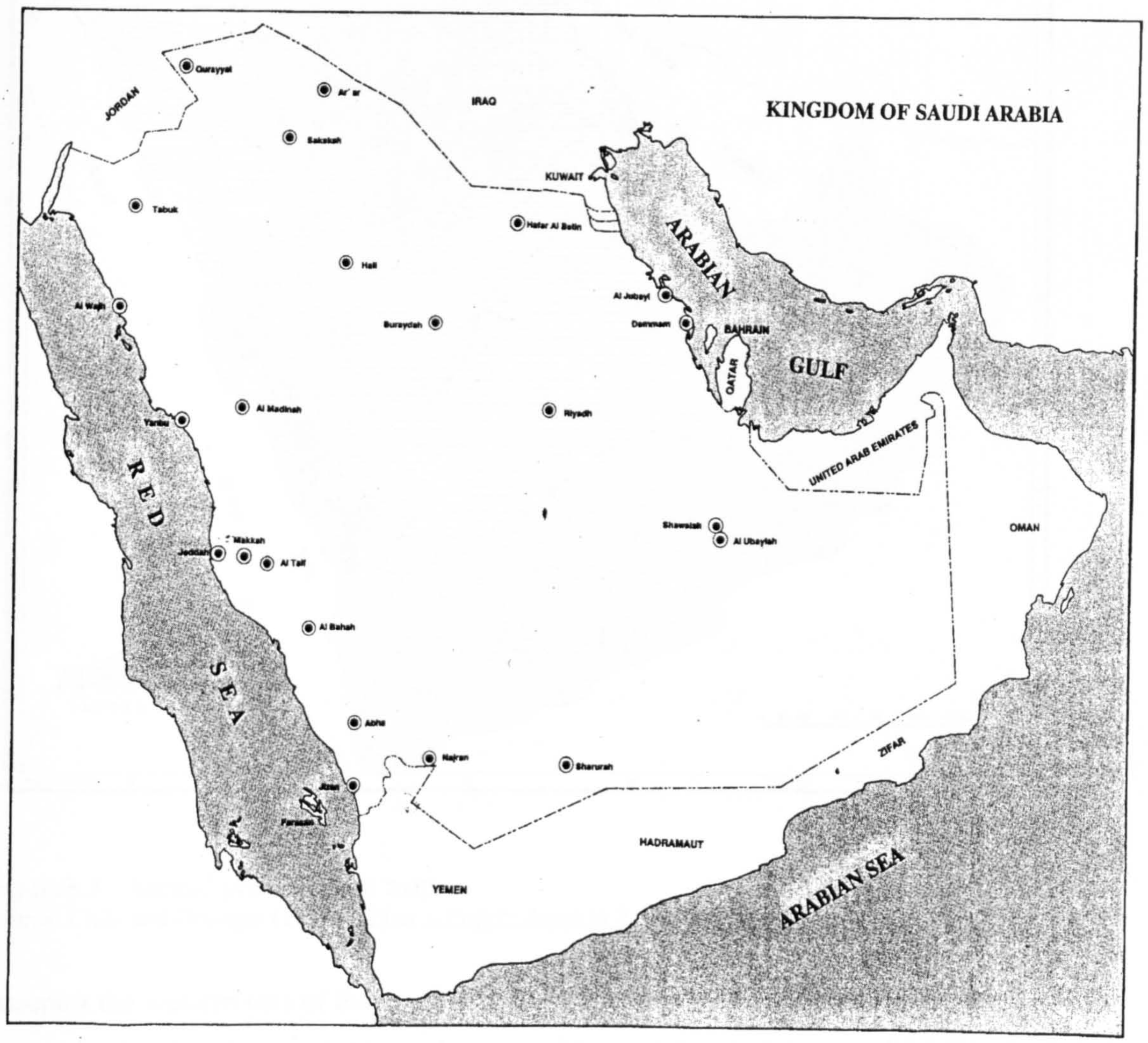

Figure 3.1. Location map of Saudi Arabia.
Source: MOP, Sixth Development Plan (1995).

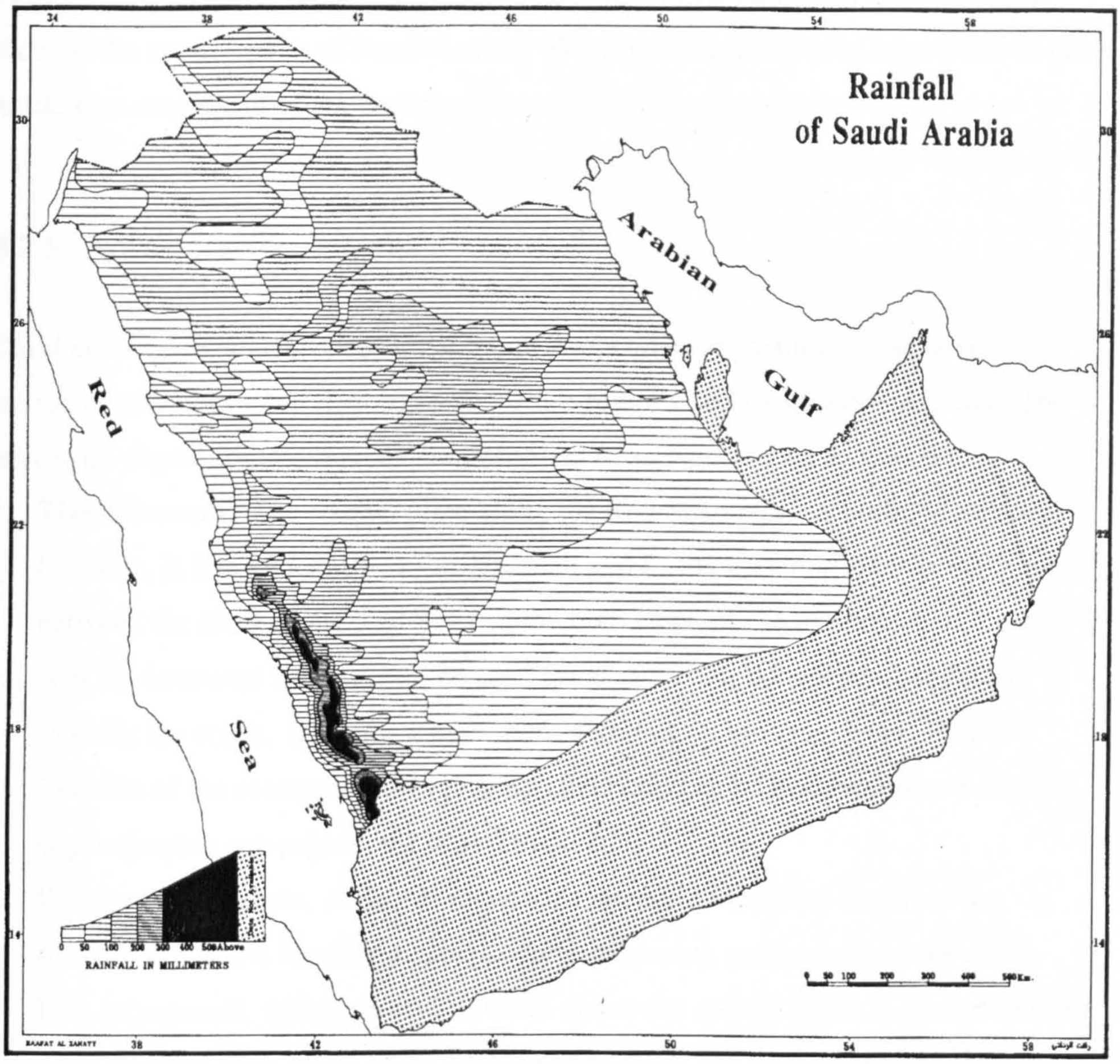

Figure3.2. Annual precipitation map.
Source: Child and Grainger (1990) A Plan to Protect Areas in Saudi Arabia .

occupies the western part of the peninsula. By Cambrian times, about 500 million years ago, the shield was a stable land mass and formed the platform on which the cover rocks of the Arabian Shelf were deposited. Volcanic activity occurred from the Tertiary period to the recent past and produced extended lava fields or *harrahs*, whose horizontal plateau-like surfaces cover some 99,000 sq. km of the shield's surface (Child and Grainger, 1990). (See Figure3.3 for generalised geology information.)

The Arabian Shelf lies to the east of the shield and makes up two thirds of the Arabian peninsula. The shelf slopes gently towards the Arabian Gulf and Al-Rub Al-Khali. It is interrupted by a series of escarpments in which Palaeozoic, Mesozoic, and lower

Tertiary beds outcrop. Unconsolidated Quaternary-aged sands and gravel blanket most of the eastern parts of Saudi Arabia. Wind-borne sands cover large parts of the north, east, and south of the country.

3.2.5 Physiographic Regions

Child and Grainger (1990) state that Saudi Arabia divides naturally into seven terrestrial physiographic regions, with 30 sub-regions and two marine regions. The terrestrial physiographic regions are described from west to east as follows:

1. **The Tihamah.** The coastal plain along the Red Sea, together with the adjacent foothills, is known locally as the Tihamah and forms a narrow transitional zone between the shelf of the Red Sea and the high slope of the mountains to the east. It is at its narrowest in the north, on the littoral of 27° N, but widens irregularly towards the south. It attains a maximum width of 40 km near Jizan. The low foothills of the escarpment which fringe the plain can be considered as a distinct physiographic sub-region, the hilly Tihamah.
2. **Western Highlands.** A belt of mountains stretches along the length of the Arabian peninsula forming a spectacular escarpment, particularly in the south. This escarpment, which rises to 3,000 m above the coastal plain, is carved into the steep western edge of the tilted Arabian Shield and has been caused by the faulting, rifting, and uplift connected with the formation of the Red Sea. These and associated mountains form a belt 40 km to 150 km wide and may be divided into three sub-regions, the Asir escarpment, the Asir highlands, and the Hijaz coastal mountains.
3. **Arabian Hinterland.** The vast trapezoid-shaped area east of the Western Highlands is one of the largest phsyiographic regions in Arabia and consists of five sub-regions, the Asir plateau, the Najd pediplain, the Harrahs, the Hisma plateau, and the great northern sandstone plain.
4. **The Cuesta Region.** The cuesta region forms part of the sedimentary Najd, which lies immediately to the east of the Najd pediplain and is made up of limestone, sandstone and shale, the 'cover rocks', which outcrop eastwards of the crystalline Arabian Shield in a curved belt up to 280 km in width. The region is typified by a cuesta morphology forming a series of west-facing escarpments.

5. **Aeolian Sands.** Wind-blown sand covers about a third of the Arabian peninsula, an area of some 855,000 sq. km. The main sand areas are in the great basins of An-Nafud and Al-Rub Al-Khali and in the low-lying areas between the slopes of the sedimentary Najd.
6. **As-Summan and Widyan Plateaux.** As-Summan is a southweastern extension of the Syrian plateau and covers the world's largest oilfield at Al-Ghawar near Al-Hofuf. It lies between the Ad-Dahna sand belt and the lows plains of the Arabian coast and is a flat, barren, sand-covered limestone feature varying between 70 km and 250 km wide. The plateau slopes gradually towards the gulf from a height of 400 m to 200 m, and contains sink holes, caves, and solution hollows, features typical of a karstic terrain.
7. **Arabian Gulf Coastal Region.** The incline towards the coast is very gradual and the coastline is characterised by extensive salt flats or sabkhas. In places the water's edge may shift several kilometres when large sabkhas such as Sabkhat Matti, which has an area of 6,000 sq. km, are engulfed.
8. **The Red Sea.** The Red Sea is approximately 1,930 km long, but averages only 280 km in width. Its entrance from the Indian Ocean at the Straits of Bab Al Mandab is only 29 km across, including the Island of Perim. The Red Sea is part of the East African system, being a continuation of the Indian Ocean ridge-sift sequence, which accounts for its depth.
9. **The Arabian Gulf.** Unlike the Red Sea, the Arabian Gulf is a broad, shallow, roughly rectangular sea around 1,000 km long and from 230 km to 250 km wide. The entrance from the Gulf of Oman is 60 km wide. (See Figure 3.4 for the physiographic regions of Saudi Arabia.)

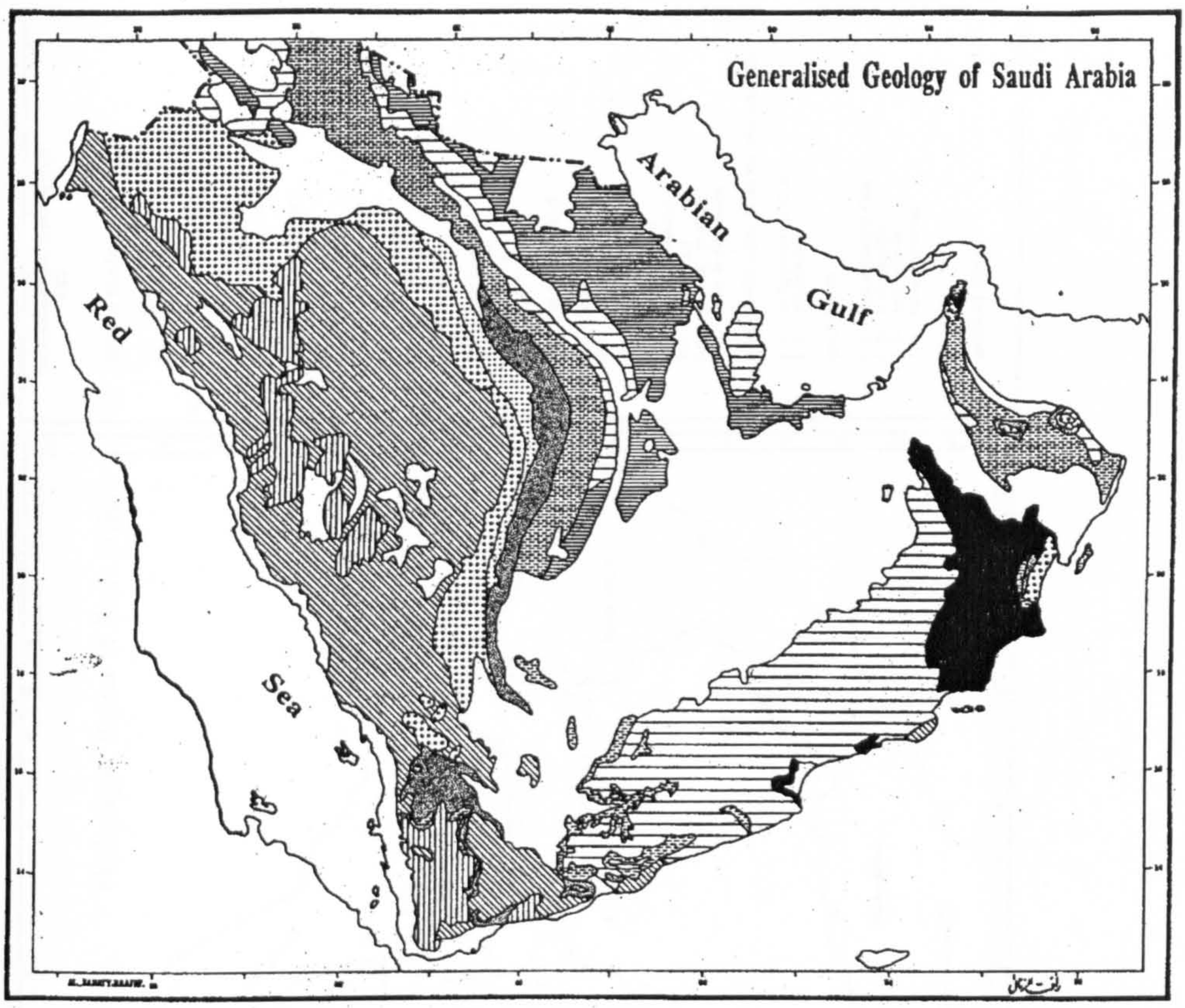

Figure 3.3. Generalised geology of Saudi Arabia.
Source: Child, and Grainger (1990) A Plan to Protect Areas in Saudi Arabia

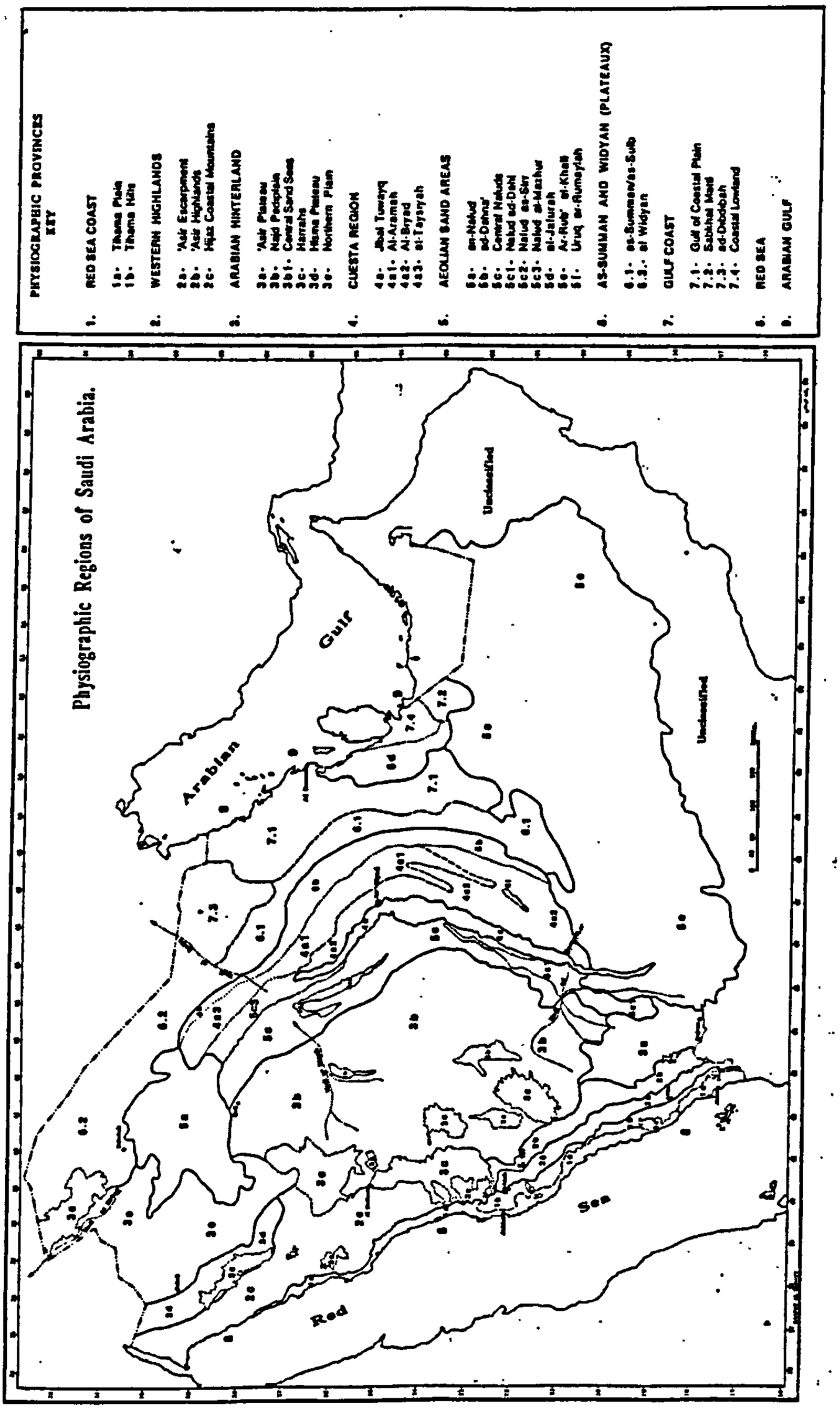

Figure 3.4. Physiographic regions of Saudi Arabia.
Source: Child and Grainger (1990) A Plan to Protect Areas in Saudi Arabia.

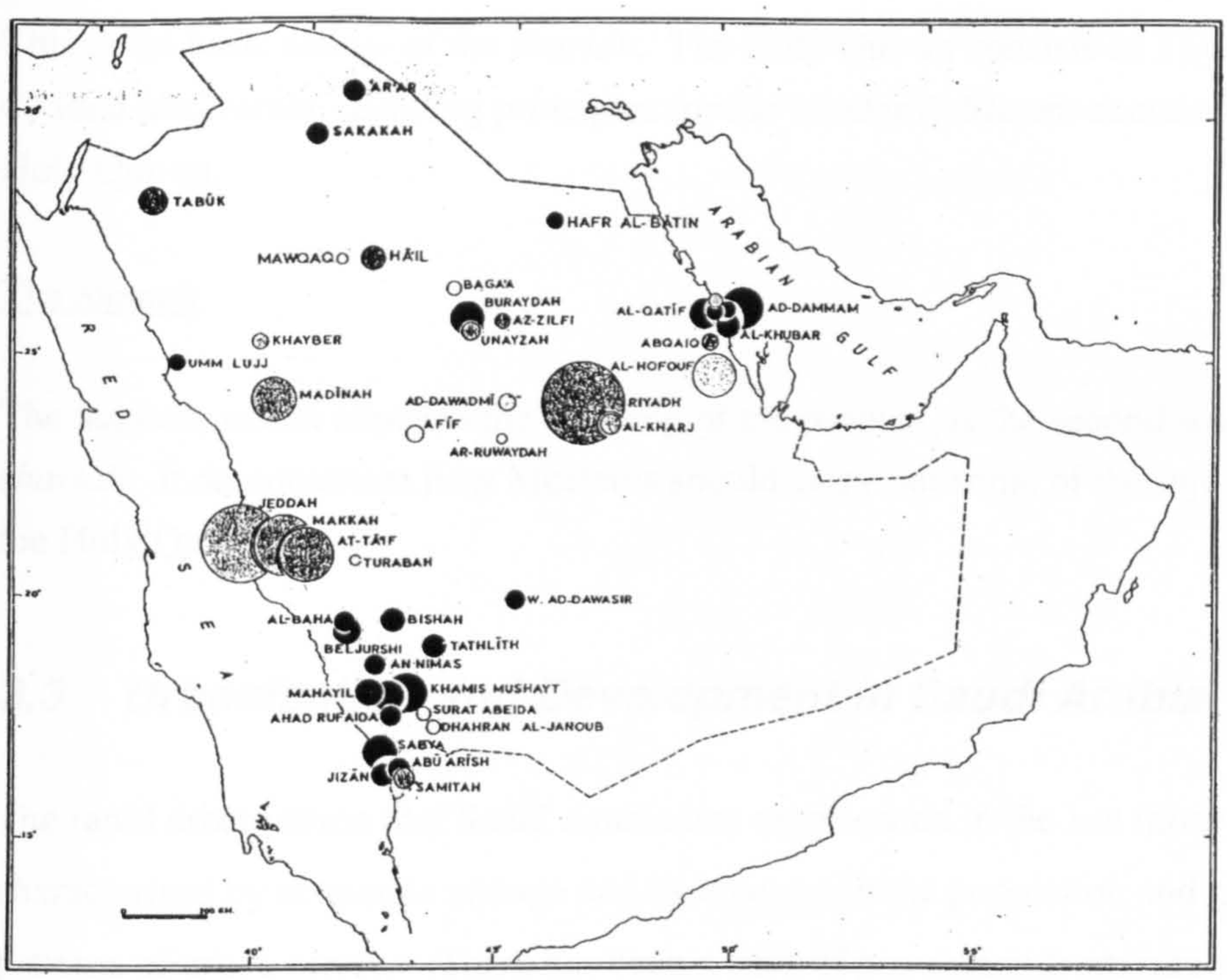

Figure 3.5. Urban population change (1974-1986).
Source: Al-Ankary and El-Bushra (1989)

3.2.6 Legislation In Saudi Arabia

Legislation in Saudi Arabia is totally Islamic, and legislation policy is based on two major sources: the *shariah* (Islamic Law), and the decrees and ordinances issued by the government in accordance with the *shariah*.

Shariah (Islamic Laws)

The major sources for Islamic laws are the Qur-an and *Sunnah* (prophet's tradition, peace be upon him). All legislation in Saudi Arabia should be derived from these two sources. (See Al-Kadi, 1989.)

The Holy Qur-an

This is the basic source of the *shariah*. The Holy Qur-an consists of 114 chapters, divided into verses. Binding principles for the Moslem's life are contained in the Holy Qur-an.

The *Sunnah*

The *Sunnah*, which explains the teaching of the prophet, is the second source of the *shariah*. It demonstrates how Moslems should carry out some of the injunctions of the Holy Qur-an.

3.3 Urbanisation and Development in Saudi Arabia

The rapid urbanisation that Saudi Arabia has experienced in the last thirty years is characterised by economic change and by changes in the population and growth patterns of urban centres. There has been a shift of population from rural to urban areas, with a correlated change in the older way of life. These changes have taken place with remarkable speed, especially during the economic boom starting in the mid-1970s.

A more specific examination of the social and economic changes related to urbanisation and development will be made in the next chapter. This chapter will concentrate on the general aspects of the results of urban growth.

3.3.1 Population and Settlement

Within a relatively short period of time Saudi Arabian society has been transformed from a traditional rural society into a highly developed urban society. Al-Ankary and El-Bushra (1989) have analysed this transformation process into three phases, each of which has had its particular impact.

The first phase identified by Al-Ankary and El-Bushra is pre-oil urbanisation, which began in the early years of the twentieth century and carried on until the 1950s. Urbanisation during this period was influenced by government schemes to resettle nomadic tribes. It was accompanied by comparatively few specific economic changes,

and for the most part economic life was still characterised by traditional agriculture and nomadic pastoralism, both of which did not provide any particular encouragement to the growth of urbanisation. By the year 1950 the proportion of the Saudi population which was urbanised was 10% (see Table 3.1).

Year	Percent
1950	10
1963	15
1974	45
1985	75

Table 3.1 Saudi Arabia: level of urbanisation (1955-1985).
Source: Al-Ankary and El-Bushra (1989) p 10

The second phase of Al-Ankary and El-Bushra is pre-planning urban growth, which accompanied the large-scale production of oil. Oil had been discovered in Saudi Arabia in 1938 and commercial production started in 1939. It was not until the 1950s, however, that large quantities of oil began to be produced, and it was then that this second urbanisation stage began. The impact of the oil industry on urban growth and general urbanisation could be seen in two ways. Firstly new towns had to be built in the production areas, and secondly the great wealth generated by the oil industry provided an impetus to the expansion of existing large population settlements, such as Riyadh, Jeddah, Makkah, and Madinah. With this second urbanisation phase the

City	Percent of Migrants
Khubar	96.00
Dammam	92.20
Jeddah	88.20
Madinah	64.20
Makkah	58.60
Yanbu	27.30
Hofouf	21.10
Qatif	13.90
Al-Mubaraz	10.70

Table 3.2 Saudi Arabia: migrants in selected cities 1972.
Source: Al-Ankary and El-Bushra (1989), p. 10.

economic base and the provision of services became more complex and the population of towns and cities more cosmopolitan. During this period urban growth was due more to migration (both internal and external) than to natural increase in the indigenous population. Table 3.2 shows the percentage of migrants in selected cities in the year 1972.

The third phase distinguished by Al-Ankary and El-Bushra is the planned urbanisation which commenced in the early 1970s with the economic boom and continues to the present day. This stage, the most important of the three urbanisation phases, is characterised by the application of specific development plans at national, regional, and local level.

From a position, in 1950, where they constituted 60% of the Saudi population, nomadic groups have declined in numbers to such an extent that they now make up no more than 5% of the population. The vast majority of people are therefore now living in settled conditions, whether in towns or in rural areas. These figures are an indication of speed with which recent urbanisation has taken place in Saudi Arabia. The rate has been one of the fastest in the Gulf area and among Arab countries (see Table 3.3).

Countries	Annual Rate of Growth 1965-73	Annual Rate of Growth 1973-83
Saudi Arabia	8.40	7.40
Kuwait	9.30	7.80
United Arab Emirates	16.70	11.20
Oman	10.80	17.70
Iraq	5.70	5.30
Gulf countries	8.90	7.90
Other Arab Countries	5.10	4.10

Table 3.3. Saudi Arabia: annual rates of urban growth among Gulf and other Arab countries (1965-1973 and 1973-1983).
Source: Al-Ankary and El-Bushra (1989) p 10

The growth of urban centres and the increase in urban population are results, then, not just of the unregulated economic effect of the growth in oil production, but of

particular efforts on the part of the authorities to adapt to and control this development. Huge investments in socio-economic programmes, infrastructure, and building, along with great improvements in the provision of health care, education and other services, and the encouragement of industrial diversification in the wake of the oil industry (thus providing both opportunities for work and an increased quality in services and amenities) have all been the results of specific planned government initiatives. Major urban centres such as Riyadh, Dammam, Jeddah, and Makkah have seen the greatest benefit from this planned development (Jomma, 1991, pp. 246-248). Both Riyadh and Jeddah grew from small towns with about 30,000 inhabitants in the 1940s to large cities with populations of over a million by 1985.

City	1940s	1974	1986	% increase 1974-1986
Riyadh	30.000	672.382	1.310.624	95
Jeddah	30.000	568.046	1.032.855	82
Makkah	80.000	366.801	666.940	82
Taif	5.000	282.913	514.410	82
Hofouf	30.000	237.993	345.610	45
Madinah	20.000	198.186	360.353	82
Dammam	N/a	127.844	260.48	103
Al-Qatif	N/a	88.648	180.319	103
Buraydah	20.000	76.442	208.152	172
Tabuk	10.000	74.825	139.275	86
Al-Khamis	N/a	71.653	310.624	95
Abha	N/a	61.359	160.290	161
Hail	10.000	59.76	110.901	86
Khubar	N/a	48.817	99.298	103
Jubail	3.000	7.441	66.000	787

Table 3.4. Population growth in selected cities in Saudi Arabia (1940s, 1974 and 1985).(n/a) information not available.
Sources: Al-Ankary and El-Bushra (1989) p 4

Table 3.2 (as we have seen) and Table 3.4 show the proportion of migrants and the population growth respectively in selected Saudi cities. Population increase has been particularly noticeable in some cities in the eastern region (e.g. Dammam and Khubar, with 103% in both cases from 1974 to 1986), where oil activity is particularly

widespread (see also Table 3.6 in this respect). This intensive oil activity led to many foreigners coming to the eastern area to work, so that it is also in some eastern cities that the most striking migrant percentages have been noted. Again Dammam, with 92.2% of its population consisting of migrants in 1972, and Khubar (96% in 1972) stand out. (See Table 3.4 showing urban population change, 1974-1986.)

Table 3.4 also gives some idea of the overall population increase in the kingdom. Preliminary figures from the most recent census show that numbers rose from around 6.3 million in 1973 to around 17 million in 1993. Table 3.5 shows the number of housing units in Saudi Arabia, with a breakdown of the population into male/female and Saudi/non-Saudi.

Total			Non-Saudi			Saudi		
Total	Male	Female	Total	Male	Female	Total	Male	Female
16930625	7459748	9470877	4624734	1369305	3255429	12305891	6090443	6215448
Number of Housing Unit		2,791,223						

Table 3.5. Number of housing units and population In Saudi Arabia (1992).
Source: Central Department of Statistics (1993) 'Preliminary Estimates from 1992 Population Census'.

	Urban Population in Thousands		
Region	1974	1984	1992
Eastern Region	770.0	1,078.0	2,331.4
Western Region	2,459.0	3,482.0	4,690.9
Central Region	1,589.0	2,260.0	3,997.5
Northern Region	679.0	951.0	1,045.8
Southern Region	1,232.0	1,741.0	999.3

Table 3.6. Urban population by region in thousands.
Source: Constructed by the researcher from the Central Department of Statistics (1993) 'Preliminary Estimates from the 1992 Population Census', and from Al-Mubarak (1993) 'The Kingdom's Statistics and Indicators'. National Spatial Strategy.

The average population growth is 3.8% per year. As well as the influx of foreign nationals, other factors have contributed to the population increase. These factors include a decrease in death rates, a steady birth rate since 1975, an improvement in

living standards and income levels, and an improvement in the levels of social and physical infrastructure.

Table 3.6 shows the distribution of Saudi Arabia's urban population in the five regions for the years 1974, 1984, and 1992. Table 3.7 shows the distribution of urban settlements in 1992. The data in these two tables indicate both the pattern of urbanisation and the speed at which it has taken place. In 1974 the highest number of people in urban communities was in the Western Region. This was still the case in 1992, although the urban population of all regions except the Southern had increased (see Figure 3.6). The proportional increase was particularly noticeable in the Eastern Region, as has been mentioned above.

Province	Settlements	Percent of Settlements	Percent of Saudis	Total Urban Population	Percentage	Level of Urbanisation	% of Municipal Population 1987
Western	62	18.08	60.19	4,688,592	35.87	27.70	42.10
Central	85	24.78	69.17	3,994,798	30.56	23.60	28.70
Eastern	73	21.28	74.03	2,326,502	17.80	13.74	15.10
Southern	72	20.99	76.33	975,769	7.47	5.76	6.50
Northern	38	11.08	83.03	1,041,558	7.97	6.15	7.60
Undefined*	13	3.79	83.33	42,696	0.33	0.25	
Total	343	100	68.50	13,069,915	100	77.20	100
*Settlement which could not be classified at this stage							

Table 3.7. Distribution of urban population (settlements of 2,400 or above) in 1992.
Sources: Central Department of Statistics (1993) 'Preliminary Estimates from 1992 Population Census' and from MOMRA (1989) 'The Urban Boundary Studies'.

According to figures relating to the year 1985, the Kingdom of Saudi Arabia had 10,500 settlements of various sizes overall, from large cities to small villages and *hijar*. Of these settlements 135 could be considered urban (with 2,400 or more inhabitants), and the rest were villages (most of those very small, with fewer than 300 inhabitants). Of the 135 urban communities, 14 had populations of 50,000 or more; these included Makkah, Jeddah, Riyadh, Dammam, and Taif. A breakdown of settlement sizes for the years 1974 and 1985 is shown in Table 3.8.

Table 3.9, based on preliminary figures from the 1992 population census and broken down by region, to some extent updates the data from 1985 (on which Table 3.8 is based). It shows that there are four centres with a population of over 500,000 and a further 27 with a population exceeding 50,000.

Settlment in size	Number of Settlements		Total Population in Thousands	
year	1974	1985	1974	1985
500.000+	2	3	1.228	2.421
250.000.-500.000	1	2	366	552
50.000-250.000	6	9	771	890
25.000-50.000	10	14	344	504
10.000-25.000	15	25	222	405
2.500-10.000	53	82	261	401
Total	87	135	3.192	5.143

Table 3.8. Urban centres in size, 1974 and 1985 (population in thousands).
Source: Central Dept. of Statistics, 1974 National Census; MOMRA estimates, cited by Zahid (1996). p. 14

Rgions	1m+	500001 -1M	100001 - 500000	50001-100000	25001-50000	10001-25000	5001-10000	2400-5000	Total No. Of settlements	Percent	% Of Population
Makkah	1	1	1	1	1	9	7	15	36	10.91	29.07
Medinah		1		1	1	3	5	5	16	4.85	6.35
Al-Baha						2	3	5	10	3.03	5.00
W. Province	1	2	1	1	2	14	15	25	62	18.79	35.87
Riyadh	1		1		5	12	13	29	61	18.48	26.28
Qassim			1	2		5	2	14	24	7.27	4.09
C.Province	1		2	2	5	17	15	43	85	25.75	30.56
E. Region			6	5	5	11	22	24	73	22.12	17.80
E. Province			6	5	5	11	22	24	73	22.12	17.80
Najran				1	1		2	5	9	2.73	1.18
Asir			2		1	5	4	11	23	6.97	3.93
Jizan				1	2	3	8	26	40	12.12	2.36
S. Province			2	2	4	8	14	42	72	21.82	6.15
Hail			1				1	8	10	3.03	1.62
N. border			1		2	1	1	3	8	2.42	1.55
Tabuk			1		1	4		2	8	2.42	3.02
Al-Jouf				1		3	2	1	7	2.12	1.07
Qurrayat				1			1	3	5	1.52	0.71
N.Province			3	2	3	8	5	17	38	11.52	6.00
Total Percent	2 0.61	2 0.61	14 4.24	13 3.94	19 5.76	58 17.58	71 21.52	151 45.76	330 100.00	100.00	100.00
Percent of population		12.08	23.46	7.55	5.18	7.03	3.72	3.95	100.00		

Table 3.9. Regional distribution of settlements by population size, 1992.
Source: Central Dept. of Statistics (1993) 'Preliminary Estimates from 1992 Population Census'.

Table 3.10 shows how the number of settlements has increased from 1985 to 1992.

Urbanisation and development in Saudi Arabia are to a very great extent a direct outcome of economic and social changes which came about as a result of government plans and policies. In order to facilitate an understanding of such urbanisation and development and the impact they have made, a consideration of these government plans and policies will now follow.

Emirates	Urban Centres					
	Over 500.000 inhabitants		250,000-500,000		50,000-250,000	
	1993	1985	1993	1985	1993	1985
Holy Makkah	2	2	1	1	1	
Riyadh	1	1			1	
Holy Madinah	1			1	1	
Eastern Region			1		10	3
Qassim					3	2
Tabuk			1			1
Hail					1	1
Assir			1		1	1
Nasraa					1	1
Total	4	3	4	2	19	9

Table 3.10. Settlements by size and regional distribution, 1985-1993.
Sources: Central Dept. of Statistics (1993) 'Preliminary Estimates from 1992 Population Census', National Spatial Strategy (cited in Zahid, 1996). P 15

3.4 The Urban and Regional Planning Process and National Development Plans

In this section the history of Saudi Arabia's development planning policies at national, regional, and urban level will be presented. An account of the different ministries, agencies, and institutions involved in the development planning process will also be given.

With the urban growth that Saudi Arabia has experienced during the last three decades the government has introduced a variety of planning approaches designed to counter

the perceived negative impact of rapid urbanisation. This planning has developed through distinct phases, though to some extent overlapping.

3.4.1 The First Phase

The first phase started when the government took steps to deal with physical development and urban growth. It set up agencies and special authorities to which it delegated various powers and duties. This resulted in the establishment of Amant Al Asimah and other municipalities officially responsible for the development of their respective areas. This took place as early as 1937 (Royal Decree No. 9723), and was the first instance of what became an emerging system of local government planning institutions.

This decree also defined the role of a municipality as regards the preparation of appropriate development plans, the development and enforcement of controls, and provision for utilities and other public services. (See Ministry of Municipality and Rural Affairs,1984, J, p. 4; Mubaruk, 1992, p. 126; Al-Hathloul and Anis-ur-Rahman, 1985.)

There followed the Roads and Building Statute in 1941. This statute was a recognition of the need for some sort of town planning in response to the pressure for physical improvement in the city of Makkah. The main issues addressed were planning procedures, building control, zoning, and right-of-way requirements. This statute introduced the concept of setback in Saudi Arabia, with the intention of fulfilling the need for future street widening. (See Al-Hathloul, and Anis-ur-Rahman, 1985, pp. 206-211.)

Further moves towards more systematic control of planning took place in 1947, this time in the Eastern Province. The Governor requested some assistance from the Arabian American Oil Company (ARAMCO) towards the preparation of plans for the towns of Dammam and Khubar. In 1952 Dammam replaced Hofuf as capital of the province, and ARAMCO developed plans both for that city and for Khubar, in co-operation with local authorities. Khubar was the first city to have an overall grid plan.

Meanwhile the Saudi government had set up in 1950 the Municipalities Department in the Ministry of the Interior, a reflection of the increased responsibilities which had fallen on municipalities. In 1962, the Department of Municipalities was upgraded to the level of Deputy Ministry of the Interior for Municipal Affairs, and in 1975 the Ministry of Municipal and Rural Affairs (MOMRA) came into being. MOMRA had four major responsibilities:

1. To plan the physical development of Saudi Arabia's cities and towns and develop roads and infrastructure.
2. To manage the services required to keep cities and towns clean and healthy and to maintain the infrastructure in urban areas.
3. To administer the procedures relating to the acquisition of free land, whether through sale, rental or gift, and the acquisition of land for municipal projects.
4. To co-ordinate the development of rural areas outside the jurisdiction of the municipal authorities. (See MOMRA's 1978 paper 'Mastering Urban Growth', and Al-Hathloul and Anis-ur-Rahman, 1985.)

A further instance of central control of urbanisation was the setting up in 1977 of a new organisational structure for the administration of municipalities, following the concept of limited decentralisation. This followed upon legislation by the Council of Ministers which permitted the Minister for Municipal and Rural Affairs to allow the municipalities a certain measure of freedom in town planning. A feature of the new structure was the division of cities and towns into 'A', 'B', 'C', 'D', and 'E' categories, based on population and influence. Administrative powers were granted according to category, having due regard to the differing administrative potential of communities in different categories. The five *amanahs* of Riyadh, Jeddah, Makkah, Madinah, and Dammam were placed in category 'A'. They were give considerable powers as far as the control of growth was concerned and were made directly answerable to the Minister. Table 3.11 shows town and village clusters and *amanahs* by types 'A' to 'D'.

The increasing official awareness of the need to shape and control land development also realised itself in the second Five Year Plan covering the years 1975-1980. This plan emphasised economic diversity and the rapid development of the five Saudi

regions (the Central Region, Eastern Region, Western Region, Southwest Region, and Northern Region). The following national physical development aims were laid out:

1. To make urban settlements, whether cities, towns, or villages, more enjoyable and less expensive places to live, work, and travel in.
2. To enhance the efficiency of cities, towns, and villages as trade, industry, and service centres.
3. To enable every household in the country to have a decent, safe, and sanitary home of a standard consistent with its income level.

Village clusters Type				Municipality Type					Amanah	Region
Total	D	C	B	Total	D	C	B	A		
6		3	3	28	14	12	1		1	Riyadh
6		4	2	13	2	9	1	1	3	Western
5	1	2	2	10		6	3	1		Southern
3	3			5	1	4			1	Eastern
7	1	5	1	9	3	4	1	1		Qassim
1		1		3		3				Northern
1	1			1				1		Al-Ahsa
7		7		4	2	1		1		Hail
6	2	4		6		3	3			Jizan
1	1			6	2	3		1		Tabuk
1		1		2	1		1			Najran
2		1	1	4	1	1	1	1		Baha
1	1			5	1	2	2			Municipalties and Clusters report direct to MOMRA
47	10	28	9	96	28	48	13	7	5	Total

Table 3.11. Number of towns and village clusters by municipality type.
Source:Zahid(1996).

In order to facilitate the achievement of objectives the plan laid out these policies:

1. Prepare and implement master plans for both large and small towns.
2. Provide an adequate supply of piped water for all municipal residents.

3. Establish integrated rainwater drainage networks, separate from sewer networks, in large cities liable to flooding.
4. Install water-borne sewage disposal networks in all municipalities in the 'A' and 'B' categories, and in 'C' and 'D' municipalities where sewage problems were acute.
5. Provide a basic structure of permanently asphalted well-lit roads in all municipalities.
6. Create new model communities (include housing provision) in all the large and some of the medium-sized Saudi cities. (See MOP, 1975-1980.)

3.4.2 Second Phase

The second of the overlapping phases of Saudi Arabia's urban planning began in the late 1960s and ended in the mid-1970s. With the realisation in the late 1960s that increasing urbanisation had to be controlled there came also the appreciation that there was not sufficient expertise at that time within the country to do this. The government therefore engaged foreign consultants to prepare comprehensive plans for several important cites and regions in the kingdom. The development and ekistics consultants, Doxiadis Associates of Athens, were contracted to prepare the first master plan for the city of Riyadh. The city's final master plan was submitted in 1971 and approved by the Council of Ministers in 1973. (See Al-Hathloul and Anis-ur-Rahman, 1985, pp. 206-211; Al-Kadi, 1989, pp. 1-15; Mubarak, 1992, pp. 55-103.)

Doxiadis Associates, along with Kenzo Tange and Urtec, were also appointed to prepare master plans for each of Saudi Arabia's five regions. Each plan included master plans for five principal cities and towns in each region. (See Zahid, 1996, pp. 20-50; Al-Hathloul and Anis-ur-Rahman, 1985) pp. 206-211; Al-Kadi, 1989, pp. 1-15.)

3.4.2.1 The National Five Year Development Plans

This second phase of Saudi Arabia's urban planning saw the inception of the government's system of Five Year National Development Plans, which began in 1970. Although these plans have carried on into the third identifiable Saudi planning phase,

this is perhaps a suitable place to give an account of the plans and their achievements, together with some brief notes on regional and local development plans.

The plans have encompassed both aims and objectives, and the proposed procedures and mechanisms to achieve those aims and objectives. The Five Year Plans can thus be seen both as policy and as implementation documents, seeking not only to identify and define long-term national development goals but also to establish guidelines and mechanisms for reaching them. These long-term strategic aims and objectives of national development have been formulated since the first plan in 1970-1975 to provide a guiding foundation for future development efforts over a thirty year period.

The Five Year Plans have been designed to fit in with the achievement potential of the government and of the private sector and with the developing economy. Each plan has concentrated on the medium-term aims and strategies identified as being necessary to reach long-term national development goals, and has sought to assign the carrying out of its strategies to government agencies or to the private sector as seemed fitting. While all government agencies are involved in the planning process the most important preparation and co-ordinating role is assigned to the Ministry of Planning (MOP).

The Five Year Plans have, of course, been subject to the constraints that national budgets and general economic and physical considerations place upon all development initiatives. The Saudi economic performance in the last twenty years, however, has been considerable; the country's economy has grown to one of the twenty largest in the world, even though Saudi Arabia accounts for only 0.2% of the world's population. Furthermore the attempt to maintain Islamic values in development plans has been successful. The country is now on the sixth Five Year Plan, covering development for the years 1995-2000.

3.4.2.2 The First National Development Plan

This plan covered the period 1970-1975 and its main objective was to continue the steady expansion of the economy. It was modest in size, about SR 78 billion (£12 billion) being spent on developing the basic infrastructure and government services

and on the establishment and expansion of supporting institutions. (See MOP, 1990, p. 6; MOP, 1995, p. 44; Al-Mubarak, 1993, pp. 192-201.)

3.4.2.3 The Second National Development Plan

This plan covered the period 1975-1980. Its main goals were: (i) to assure the defence and the internal security of the kingdom; (ii) to maintain a high rate of economic growth, maximising earnings from oil over the long term by conserving depletable resources; (iii) to reduce economic dependence on the export of crude oil; (iv) to increase the well-being of all groups within society and foster social stability under circumstances of rapid social change; (v) to develop the physical infrastructure to support the achievement of the above goals. Government expenditure reached SR 685 billion (£105.8 billion), about a nine-fold increase over the first plan. To achieve the goals the government set up many agencies during the period of this second plan, such as the Ministry of Industry and Electricity, the Royal Commission for Jubail and Yanbu, and the creation of the Saudi Arabian Basic Industries Corporation (SABIC). (See MOP, 1990, p. 6; MOP, 1995, p. 44; Al-Mubarak, 1993, pp. 202-222.)

3.4.2.4 The Third National Development Plan

This plan covered the period 1980-1985. Its main objectives were to accelerate the construction of the physical infrastructure and to lay the foundations for a more diversified economy. (See MOP, 1990, p. 6; MOP, 1995, p. 44.)

3.4.2.5 The Fourth National Development Plan

This plan covered the period 1985-1990, with a total government expenditure of SR 1,000 billion. Its major objectives were: (i) to continue the structural change in the economy in order to diversify the economic base and thus reduce dependence on crude oil income; (ii) to encourage the rapid development of the private sector as the main instrument for achieving this diversification; (iii) to complete the infrastructure projects necessary to reach long-term economic and social development goals; (iv) to develop further the country's human resources. (See MOP, 1990, pp. 4-17; MOP, 1995, p. 45.)

3.4.2.6 The Fifth National Development Plan

This plan covered the period 1990-1995. Its main objectives, as established by the Council of Ministers, were: (i) to safeguard Islamic values by duly observing, disseminating, and confirming Allah's s*hariah* (God's Divine Law); (ii) to defend the faith and the nation and to uphold the security and social stability of the kingdom; (iii) to form a productive national workforce by encouraging citizens to avail themselves of the benefits from the infrastructure and institutions provided by the state, ensuring their livelihood and rewarding them on the basis of their work; (iv) to develop the human resources pool, thus ensuring a constant manpower supply, upgrading its quality and improving its efficiency to meet the requirements of the national economy; (v) to raise cultural and information standards to keep pace with the country's development; (vi) to continue the reduction of dependence on crude oil as Saudi Arabia's main source of wealth; (vii) to continue with real structural changes in the economy so as to sustain the movement towards a diversified economic base, with due emphasis on industry and agriculture: (viii) to develop mineral resources and encourage their discovery and utilisation; (ix) to improve the quality of already established utilities by enhancing their performance level; (x) to complete the infrastructure projects necessary to achieve overall development; (xi) further to encourage private sector participation in socio-economic development; (xii) to reach balanced growth in all regions of the kingdom; (xiii) to achieve economic and social integration among the Gulf Corporation Council (GCC) countries. (See MOP, 1990, 1995 pp. 4-17; MOP, 1995, p. 45.)

The fifth plan showed the importance of the private sector in the development process and placed the emphasis on regional development rather than planning at a national level only, which is how it had been with the previous four plans. Furthermore Section 15.4 of the fifth plan, Development and the Environment, introduced and discussed environmental issues in the context of development. These issues will be dealt with fully in the next chapter.

3.4.2.7 The Achievements of Past Development Plans

The first twenty-five years of Five Year Plans have achieved the following:

1. Economic growth and stability. A growth of 6% in non-oil GDP was achieved over the first five development plans. Between 1970 and 1995 the average annual inflation was no more than 5.3%, and it has dropped to 1% over the last ten years.
2. Diversification of the economic base and reduction of dependence on crude oil. Sustainable long-term development is at risk as long as there is dependence on just one commodity, in the case of Saudi Arabia, oil. Each plan has therefore given priority to establishing other strong economic sectors and income sources. (See also number 6 below.)
3. The development of human resources. The plans have placed great emphasis upon the development of human resources through ongoing advances in education and training. The result has been a great increase in the productive employment of Saudi citizens.
4. The development and preservation of the physical infrastructure. In line with the rapid growth patterns in the country, the first three Five Year Plans concentrated on the establishment and expansion of the physical infrastructure, while the fourth and fifth placed greater emphasis on the enhancement of the quality of that infrastructure.
5. Improvements in the quality of life. Through the implementation of the Five Year Plans a high standard of living, comparable to that of many developed countries, has been achieved in Saudi Arabia.
6. The expansion of the private sector role. The encouragement of private sector initiative has been an important feature of the development plans. The private sector has been urged to engage in joint ventures with foreign companies and to invest in new output generating capacities using the latest technology. The fifth plan in particular gave higher priority to the role of the private sector in accelerating the process of economic diversification, referred to in number 2 above. The plans have given, and continue to give, direction to the private sector on the likely course of the economy, and on related government policies and business opportunities. The outcome is now that the private sector is more independent of government finance than it was when the development plans were

first introduced. The strength and independence of the private sector are an important feature of present-day Saudi economy.

3.4.2.8 The Sixth National Development Plan

This plan covers the period 1995-2000. Its main objectives as established by the Council of Ministers are these:

> (i) to safeguard Islamic values by duly observing, disseminating, and confirming Allah's *sharia* (God's Divine Law); (ii) to make productive national citizens by providing them with the appropriate means and sources of income and ascertaining their rewards on the basis of their work; (iii) to develop human resources and continually to ensure an increasing supply of manpower, upgrading its efficiency to meet the requirements of the national economy, and replacing non-Saudi manpower with suitably qualified Saudis; (iv) to achieve balanced growth throughout all regions of the kingdom; (v) to continue to encourage private sector participation in socio-economic development; (vi) to reduce dependence on the production of crude oil as the main source of national income; (vii) to continue with the restructuring of the country's economy through an ongoing diversification of the economic base, particularly through laying more emphasis on industry and agriculture; (vii) to develop mineral resources and to encourage their discovery and utilisation; (viii) to concentrate on qualitative development of existing utilities and facilities by improving their performance level; (ix) to complete infrastructure projects necessary to achieve overall development; (x) to promote scientific activity and to raise cultural and information standards to keep pace with the kingdom's development; (xi) to achieve economic and social integration among the GCC countries, and to support economic co-operation with Arab, Islamic, and other friendly countries. P (87-88)

The Sixth Development Plan will therefore continue to enhance and broaden the objectives of the previous plans through maximising the private sector's co-operation in the provision of jobs, through continuing the diversification of the economy to decrease its dependence on oil revenue, through providing new physical infrastructure for the expanding population, through improving social services, through attempting to raise per capita income, and through aiming to maintain a balanced budget over the five year period. The sixth plan gives priority to expanding the fields of technological

development and environmental protection, and to boosting regional and international co-operation.

3.4.2.9 Regional Development Plans

Saudi Arabia is divided geographically into five planning regions - Central, Eastern, Western, Northern, and Southwestern. It is divided administratively into14 emirates.

The main goal of the regional planning of national development is the interface between socio-economic development for the entire country and physical planning. Regional planning seeks to ensure the co-ordination of sectoral development efforts by reinforcing the physical and functional interaction between sectors. (See MOP, 1995, p. 367.)

During the period of the second Five Year National Development Plan regional development was seen in terms of improving and expanding the infrastructure, and extending municipal services and electricity to rural areas. Government agencies introduced their own directories and branches to serve the needs of various regions.

The MOP placed strong emphasis on regional planning, and during the third National Development Plan several regional initiatives were taken. The aims of these were the expansion of services and wealth to the population and the development of regional productive activities so that the migration of population from rural to other areas might be reduced. (See Al-Ankary, 1989, p. 11.)

During the fourth Five Year Plan (1985-1990) the greater concentration on a more even distribution of wealth by spreading services throughout rural areas, along with an emphasis on completing projects already begun, meant that more comprehensive regional and urban planning with an interdisciplinary approach arose. It was at this time that the kingdom was divided into five planning regions with the intention of developing comprehensive regional physical plans and master plans for major cities. Later regional planning concentrated on the integration of rural and urban development at the district level, within national or regional strategies, and this has

gone some way along the road to implementation. (See Al-Ankary and El-Bushra, 1989, p. 11.)

The period covered by the fifth and sixth National Plans (1990-2000) has seen the continuation of concentration on regional development in order to achieve balanced growth throughout all regions of the kingdom. (See MOP, 1990, p. 367; MOP, 1995, p. 367.)

3.4.2.10 Local Development Plans

Local development plans began in the late 1930s in response to the needs of urban areas; the early concentration was on physical planning. The plans which ARAMCO had been asked to prepare for Khubar city resulted in the first Saudi Arabian city to be laid out in a gridiron pattern. Other Saudi cities were to follow in later decades. (See Al-Hathloul and Anis-ur-Rahman, 1985.)

Along with the grid system ARAMCO also introduced the villa type of housing, intended for its Saudi employees, on square lots with setback. This gridiron type of model, with a hierarchy of streets, rectangular blocks, and large square-shaped lots, has gradually gained ground in Saudi cities, following its introduction in 1953 to Riyadh. (See Al-Hathloul and Anis-ur-Rahman, 1985, pp. 206-211.)

3.4.3 The Third Phase

The third planning phase in Saudi Arabia began in the mid-1970s and carried on to the mid-1980s. The year 1976 saw the establishment of the Deputy Ministry of Town Planning (DMTP), which appointed a series of international consultants to prepare action master plans for the cities, Taif, Abha, Madinah and Jizan. Detailed plans for surrounding suburban and rural areas were also required. The consultants were also asked to help in the setting up of planning and development departments in the cities concerned, so that the institutional machinery was in place to ensure that the planning process, based on the master plans, could continue in the future. (See Al-Hathloul and Anis-ur-Rahman, 1985, pp. 206-211; Al-Kadi, 1989, pp. 1-15.)

During this third stage the government was concerned to link national economic planning with local physical planning initiatives and the DMTP undertook five regional comprehensive development projects. Regional plans were devised for the Hail, Qassim, Makkah, Al-Baha, and Tubuk regions. (See Al-Ankary and El-Bushra, 1989; Al-Hathloul and Anis-ur-Rahman, 1985, pp. 206-211.)

From the mid 1980s onwards the DMTP, making use of Saudi experts, including its own staff, and resident consultants, made ready two urban policy master plan documents: the National Spatial Strategy 1990-2010, and the Urban Growth Boundaries (UGB) document, for towns and cities for the next twenty years.

3.5 Government Structure and Government Agencies and Ministries Involved in Development Planning

At the top of Saudi Arabia's government structure is the King, who commands a great deal of control in all decisions. The king presides over the Council of Ministers (CM). Members of the CM include 23 Ministers heading the various bureaucratic ministries, departments, and agencies.

The government consists of seven major components where all interrelated with different function as follows:

1. The King
2. The Council of Ministers
3. The council of Ash-Shura
4. The ministries
5. The independent agencies.
6. The public enterprises
7. Local government.(see Al-Mobark, 1993).

In addition the following bodies are involved directly and indirectly in physical development planning:

1. The Ministry of Planning (MOP)

2. The Ministry of Municipal and Rural Affairs (MOMRA)
3. The Ministry of Agriculture and Winter (MOA)
4. The Ministry of Industry and Electricity (MOIE)
5. The Ministry of Finance and National Economy (MOFNE)
6. The General Civil Defence Administration and the Ministry of the Interior (GCDA)
7. The Organisation of Al-Amro Bil Maroof Wal Nahi Anil Monker, (OOABNM).which mean in english(to command good and forbid evil).

(See Al-Kadi, 1989.)

Of the various bodies mentioned above MOMRA is the agency most concerned with physical planning. It is involved in urban and regional development at three levels:

1. At the central or national level, with MOMRA headquarters located in Riyadh.
2. At the regional level there are the directorates of municipal and rural affairs.
3. At the local level, there are the municipalities. (See Al-Ankary, 1991, pp. 85-98.)

In general decisions of the CM are implemented through government agencies. Each of the five provinces or regions is under the direction of a Governor whose office is responsible for urban and rural matters. Within the provinces each township has an appointed mayor who heads the *Baladia* (local council). (See Al-Farsy, 1978, p. 96; Al-Mubarak, 1992, p. 123.)

3.6 Economic Development in Saudi Arabia and the Output of the Five Year National Development Plans

As we have seen, Saudi Arabia has adopted and implemented five Five Year National Development Plans since the year 1970, and the seventh plan is at present underway. Some objectives run through all these plans, such as the development of human resources, the development and indeed the completion of physical infrastructure projects, raising the standard of living, maintaining high economic growth, strengthening the role of the private sector in economic development, diversifying the economy, and maintaining social stability.

3.6.1 Government Expenditure through the National Development Plans

Table 3.12 shows the main focus of the first four development plans and amounts spent on the major sectors. It indicates that the second plan incurred a total expenditure of SR 347,212 million, which is almost ten times that of the first plan..

Government spending on infrastructure development was SR 14,116 million, about 41.4% of the total, in the first plan. In the second plan, infrastructure development spending was SR 171,298 million, about 49.3% of the total, and in the third it was SR 256,975 million. The fourth and fifth plans concentrated on the completion and improvement of the infrastructure. The spending on it in the fourth plan accounted for about 29% of total expenditure. Table 3.13 indicates expenditure in the fifth plan, and it can be seen from it that infrastructure spending (under 'transport and communications') was around SR 42.2 billion. Spending on infrastructure, then, has been greater than on any one other sector, especially in the earlier plans where the emphasis was on creating basic infrastructure rather than upgrading and enhancing it. In these two later plans the government concentrated more on spending in the health and human resources areas. (See MOP, 1995.)

Plan	First		Second		Third		Fourth	
Development Sector	SR million	Percent	SR million	Percent	SR million	Percent	SR million	Percent
Economic Resources	9,469	27.7	97,279	28.0	192,185	30.7	71,193	20.4
Human Resources	7,034	20.6	51,035	14.7	115,007	18.4	115,133	33.0
Health and Social	3,515	10.3	27,600	7.9	61,237	9.8	61,882	17.7
Infrastructure	14,116	41.4	171,298	49.3	256,795	41.1	100,738	28.9
Total	34,134	100	347212	100.0	625224	100.0	348,946	100.0

Table 3.12. Expenditure of development agencies in the first four Development Plans, 1970-1990.
Source: MOP (1995), p 46

The emphasis on human resources in the later development plans has resulted in a more productive Saudi workforce.

Spending Category	Percentage Distribution		Actual Expenditure**	
	Plan %	Actual %	Value (SR billion)	% of Plan
Economic Resources	15.8	10.6	34.7	61.4
Human Resources	39.1	47.3	155.0	111.1
Health and Social Services	17.9	19.3	63.3	99.0
Transport & Communications	14.7	12.9	42.4	80.6
Municipalities and Housing	12.5	9.9	32.4	72.3
Total	100.0	100.0	327.8	91.7

Table 3.13. Allocation of expenditure in the Fifth National Development Plan.*
*Excluding loans from the government's specialised credit institutions.
**Amounts for the last year of the plan are estimates.
Source: MOP (1990) p 65

Tables 3.14 and 3.15 show the development of the social and physical infrastructure in Saudi Arabia during the period of the five completed National Development Plans. The rapid expansion in infrastructure provision clearly can be seen.

Physical Infrastructure	1970-74	1974	1984	1990	1995
Paved Roads (1,000 km)	12	19	28	40	43
Berths	11				179
Airports					25
Generated Electricity (1,000 mw)	4	18	45	65	83
Telephone Lines	29,000				1.53 m

Table 3.14. Physical infrastructure achievement in the first five Development Plans, 1970-1995.
Sources: Constructed by the researcher using data from the following: MOP, Fifth and Sixth Development Plans (1985-1995); Jeddah Information Centre (1993) 'The Kingdom's Statistics and Indicators'.
Blanks indicate unavailable data.

Social Infrastructure	1970-74	1974	1984	1990	1995
Schools & Institutions (1,000)	6	11	15.8	17.8	22
Students (100,000)	1	1.5	2.3	3.3	3.75
Hospitals		65	105	253	280
Hospital Beds (1,000)	10	12	20	26	42
Physicians (1,000)	1			22.6	28

Table 3.15. Social infrastructure achievement in the first five Development Plans, 1970-1995.
Sources: Constructed by the researcher using data from the following: MOP, Fifth and Sixth development Plans (1985-1995); Jeddah Information Centre (1993) 'The Kingdom's Statistics and Indicators'; Al-Mubarak (1993).
Blanks indicate unavailable data.

3.6.2 Housing

In the 1970s there was a great increase in housing development due to many factors, some of which have been discussed in previous sections, and which have to do with increasing urbanisation. Specifically these factors include the increase in housing demand which followed the rise in oil prices in the 1970s, immigration by foreign workers, domestic migration towards the major metropolitan centres, and perceived inadequacies in existing housing. The government set up the Real Estate Development Fund (REDF) to fund building in general and housing in particular. (See Al-Oweid, 1994, pp. 77, 78.)

Table 3.16 shows statistics relating to private housing loans by the REDF from 1975/6 to 1987/8. In addition, by the end of the period of the fifth plan (1990-1995), the total number of housing units in the kingdom was 2, 850,000, with 2,604,430 resulting from private sector construction and the remaining 245,570 by the Ministry of Public Works and Housing and other government agencies. (See MOP, Sixth Development Plan, 1995-2000, p. 385.)

Fiscal Year	No. of Applications submitted	No. of Loans approved	No. of housing units	Value of Loans (SR billion)
1975-76	34.189	34.189	41.027	8.197
1976-77	46.955	46.955	56.346	13.534
1977-78	30.700	3.342	4.598	955
1978-79	35.308	34.407	41.288	8.690
1979-80	37.016	33.190	39.828	8.185
1980-81	36.815	28.593	34.312	6.956
1981-82	35.572	31.133	37.360	8.052
1982-83	41.735	35.359	42.430	9.438
1983-84	39.541	29.400	35.280	7.917
1984-85	39.280	26.215	31.458	7.131
1985-86	29.590	18.844	22.613	5.159
1986-87	17.448	11.208	13.450	3.066
1987-88	19.203	11.648	13.978	3.198
Total	443.352	344.973	413.958	90.480

Table 3.16. Private housing loans by the Real Estate Development Fund (1975/6-1987/8).Source: Al-Oweid (1994).

3.6.3 Petroleum-Based and Non-Petroleum-Based Industry

Oil production on Saudi Arabia started in 1938 with more than 0.5 million barrels in the year, and it has increased greatly since then, reaching 541.5 barrels in 1992, Table 3.17 shows data for all petroleum products up to the 1990s.

Year	1938	1939	1945	1948	1967	1980	1997
Petroleum Products (Million Barrels)	0.5	3.9	21.3	142.9	1.023	3.623	541.5

Table 3.17. Amount of petroleum products, selected years 1938-1997.
Sources: Constructed by the researcher from the following: MOP, 'Achievement of the Development Plans 1990-1995'; Jeddah Information Centre (1993) 'The Kingdom's Statistics and Indicators'; Ministerial Commission for Environment, 1992, pp. 43-50.

Table 3.18 indicates the increase in the number of companies involved in non-petroleum-based industries from 257 to 2,160 (1962-1994).

Year	1962	1976	1981	1987	1994
Number of Companies	257	635	1,373	2,065	2,160

Table 3.18. Companies involved in non-petroleum-based industries in selected years 1962-1994.
Source: Constructed by the researcher from the following: MOP (1995) 'Achievement of the Development Plans 1990-1995'; Jeddah Information Centre (1993), 'The Kingdom's Statistics and Indicators'.

3.6.4 Agriculture

Agricultural land and production during the period of the five completed National Development Plans have improved in relation to the increase in oil revenue, in the form of market expansion, transportation cost reduction, the increased adoption of modern techniques such as the use of fertilisers, improved seed quality, and the greater use of machinery, and, on the financial side, more readily accessible sources of credit. Table 3.19 shows the estimated increase in areas devoted to crops in selected years from 1977 to 1993.

Year	1977	1985	1993
Estimated Area of all Crops (Hectares)	560,986	1,082,142	1,590,557

Table 3.19. Estimated increase in areas devoted to Crops in selected years 1977-1993.

Sources: Constructed by the researcher from the following: Al-Soliman (1991); MOP (1995); Jeddah Information Centre (1993) 'The Kingdom's Statistics and Indicators'.

In addition the sixth, current, Development Plan has indicated that agricultural production has increased six-fold during the period of the first five plans, which means Saudi Arabia has moved towards self-sufficiency in foods.

Table 3.20 shows the average annual real growth in gross domestic product by economic activity in general. The growth has been substantial. The non-oil based economy performed well above the rate during the First Development Plan. It fell away, however, by the time of the fourth plan according to the fall in oil prices, but had recovered by the end of the fifth plan to about 3.6%. Agriculture production expanded from the time of the first plan to reach a peak of 13.7% by the fourth plan.

In general Table 3.20 shows that the GDP through the period covered by the five completed national plans has been substantial in each sector of the national economy.

Sector	1st Development Plan	2nd Development Plan	3rd Development Plan	4th Development Plan	5th Development Plan
*Producing Sector	12.3	16.5	3.5	-1.1	5.7
Agriculture, Forestry, Fishing	3.5	6.9	10.4	13.4	7.0
Other Mining, Quarrying	12.7	7.2	7.8	-0.9	4.0
*Manufacturing	11.6	15.2	15.2	1.8	7.7
Petroleum Refining	4.7	4.8	1.2	11.5	5.7
Petrochemicals				56.6	0.8
Other Manufacturing	11.5	15.2	14.2	-5.6	7.5
Electricity, Gas, Water	7.9	16.8	7.9	5.9	6.9
Construction	15.6	19.2	-0.2	-7.7	3.8
*Service Sectors	10.1	16.4	7.2	-1.6	3.5
Trade, Restaurants, Hotels	12.5	22.9	9.6	-1.5	3.0
Transport, Communications	9.0	10.5	7.8	-0.8	3.2
*Finance, Insurance, Real Estate, Business Services	11.1	18.4	5.2	-3.7	5.1
Real Estate	14.5	19.6	2.8	-6.7	2.8
Other	8.7	17.3	7.3	-1.7	6.6
Community and Personal Services	7.2	11.8	5.6	2.5	1.7
Government Services	6.7	7.3	7.6	1.7	0.8
*Non-oil Sectors	9.7	14.0	6.0	-0.6	3.6
Crude Oil and Natural Gas	19.2	3.7	-15.3	4.0	2.2
Other Items	2.7	37.6	9.0	-2.6	3.6
GDP	15.5	6.5	-4.9	1.8	3.2

Table 3.20. Average annual real growth of GDP by economic activity. Constant 1984 prices (during 1970-1994) in percent.
Sources: MCE (1992); MOP (1990); MOP (1995).p 70-71.

3.7 The Impact of Urbanisation and Development

In this section the impact of urbanisation and development in Saudi Arabia will be introduced and assessed both in general, and with a special focus on the oases in the kingdom.

Urbanisation and development have had the overall impact of creating a need for more land. The increase in the national income that has been the result of urbanisation and development, especially in oil-producing countries like Saudi Arabia, has brought with it a demand for higher living standards. This has meant greater pressure for housing, for infrastructure improvements, for more effective transportation, and for more open space. The number of households has increased, and with it the need for land to build on.

It has already been mentioned that the rapid expansion and urban population growth in cities such as Damman, Riyadh, Jeddah, Makkah, Taif, and Khubar have put great pressure upon the social infrastructure. Utilities supply has not kept up with growth-generated demand.

Some significant problems that Saudi Arabia has seen in recent years as urban growth has made its impact have been:

1. Housing shortages, especially in the early years of rapid urbanisation, with costs in particular affecting the less well-off.
2. Inadequacies in the provision of community facilities, especially in the most rapidly growing areas of new development.
3. Inadequate provision of basic public utilities, such as water and electricity.
4. Traffic congestion.
5. An increase in social problems and unemployment. (Quazi, 1992.)

Government measures in the form of development plans and policies helped to solve these problems and to give general direction to the changes that were taking place. These plans, already mentioned in this chapter, operated at various levels - national, regional, and local, and included the Five Year National Development Plans. They led on the one hand to improvements in most social and economic sectors, and on the other hand to effects on the environment in general.

One example of the improvements made is in housing. We have already seen that there was a great growth in the number of houses during the period covered by the five completed development plans, and we have noted (Tables 3.14, 3.15, 3.16) how the government plans and policies led to great improvements in the social and physical infrastructure. All these improvements, however, did not take place only upon land that was suited to development but had previously lain unused. There were, in addition, other potential natural resources, such as agricultural land, desert, and sea, and development encroached on some of those areas. Al-Soliman (1993) states:

> The urban growth resulted in total elimination of green areas and traditional orchards in and around cities, even more construction, an increase in domestic refuse and the exhaustion of available water resources. In all urban growth

> has led to a severe disruption of the ecological systems within and beyond urban centres. (p. 223.)

Urbanisation and development affected even the coastlines of Saudi Arabia. The country's shores extend along large sections of the Red Sea and the Arabian Gulf, with the Saudi western coastline extending about 1,850 kilometres and the eastern about 1,070 kilometres.

The coastal areas of Saudi Arabia are very important, viewed as an economic resource; they facilitate trade and the transportation of oil and people, and also provide other valuable natural resources. The impact of the urbanisation and development of the last three decades is clear to see. Coastal water provides desalinated water for urban and industrial use, as well as cooling water for power generation and other industrial applications, and recreational activities. (See Chiffing and Dakkax, 1990.) Table 3.21 shows resource use pressures on Saudi Arabia's coastal zones.

W ater and power generation
Industrial development
Navigation and shipping
Port development
Dredging
Defence and national security
Mining
Quarrying
Land reclamation
W aste disposal
Urban development
Recreation - usage and accommodation
Fishing - commercial and artisanal
Aquaculture
Grazing of stock
W ildlife, habitata and ecosystem conservation
Scientific research
Education
Archaeological and historical research
Collection of tourist artifacts
Use of vehicles off-road

Table 3.21. Resource use pressures on the coastal zones in Saudi Arabia.
Source: Chiffings and Dakkax. (1989).

As far as development is concerned, about forty percent of the Gulf coast and about eight percent of the Red Sea coast have been developed.

The discovery of oil in the eastern region of Saudi Arabia had a major environmental impact. There were developed offshore oil fields with production platforms, coastal processing plants and refineries, shipping facilities, associated urban and support industries, roads, power plants, desalination plants, dredged shipping channels, and other support infrastructure features. Large industrial conglomerations are located along the Gulf coast at Jubail, Safaniya, Ju'aymah, and around Tarut Bay, including the ports of Ras Tanura, Al-Qatif, Dammam and Khubar. Major infrastructure features are located at Tanajib, Safaniya, Jubail, Ju'aymah, Ras Tanura, and Dammam.

There has been less impact on the Red Sea side of the country, but major port growth has taken place at Jeddah, with secondary ports being developed at Jizan and Yanbu, as well as smaller service harbours along the coast at, for example, Ragibh and Farasan Kabir.

The development that took place affected the environment of the coastline. Landfilling and dredging, for example, have destroyed the intertidal and subtidal habitats along the Gulf coast, as has the construction of the corniche areas. Furthermore oil spills after the Gulf War had a negative environmental impact. There remains the risk of further oil spills in the Gulf caused by industrial or shipping accidents. On the western side the construction of Jeddah's north corniche has destroyed the entire reef flat and much of the reef face, leaving only the scenic qualities untouched. The construction of this coastal road, like that near Dammam in the east, has also meant easier access for both fishermen and divers, with the resultant running down of fish stocks with little chance to recover. (See Chiffing and Dakkax, 1989; MEPA, 1987, pp. 8-10.)

Coles and McCain (1990) have indicated that development activities like landfilling of large parts of intertidal shallow subtidal areas along Saudi Arabia's Gulf coastline has gone on since 1984, for example on Tarute island and along the entire coastline from Azizyah to Ras Tanura, where the shoreline has been shifted approximately 0.5

kilometres seawards in the construction of a corniche parallel to the existing superhighway. Furthermore it seems from preliminary calculations that a further 27 kilometres or so of shallow subtidal area has been destroyed by this operation.

Landfilling also has an impact far beyond its immediate physical surroundings, and is in fact one of the most destructive features of oil-related development; there may be altered water flow patterns, changes in the level of salinity, in temperature, and in oxygen amounts, suspension of sediments, increases in turbidity, and the possible release of sediment-bound toxic material. Natural flushing actions can be disrupted, and water pollution becomes more likely. Changes in the oxygen supply and the possible release of toxic matter can have a negative impact on much of the fauna found in seagrass and mangrove environments, and siltation can even have a direct smothering effect on animal life.

Dredging, too, can have a great detrimental effect on the environment. Resources in the area dredged are destroyed and increased sedimentation can occur.

Oil and other chemical discharges, amongst the most-publicised and spectacular possible effects of the oil industry, can cause widespread water pollution and can threaten marine life and other natural resources in an area. (See MEPA, 1987, pp. 8-10.)

Major environmental effects on the Gulf coast of Saudi Arabia are shown in Figure 3.6.

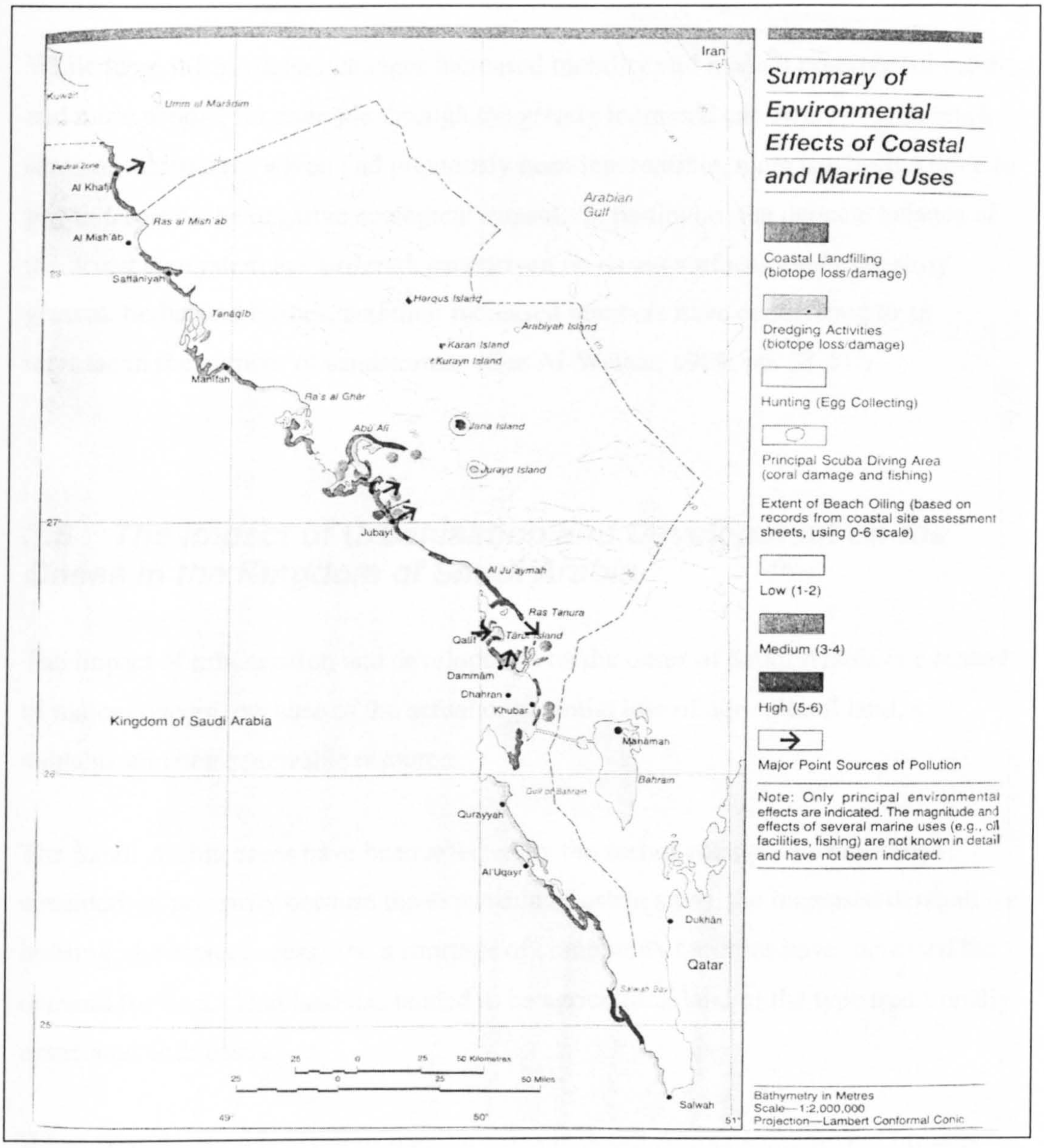

Figure 3.6: Summary of environmental effects of coastal and marine uses.
Source: Chiffing, A. and Dakkax, A. (1989).

We have already seen how the Saudi government has been concerned, throughout the period of the Five Year National Development Plans, to meet infrastructure requirements, at first putting basic infrastructures in place, and then enhancing and completing them. This strategy has met with success, and Table 3.14 shows the increase in the number between 1970 and 1995 of selected features, from paved roads to telephone lines, which may be taken as reliable indicators of the size and complexity of the infrastructure.

While these infrastructure changes increased mobility and made it possible for more and more people, for example through the greatly increased car ownership, to reach areas of the country which had previously been inaccessible, there has been a price to pay in terms of the negative ecological impact. In particular, the delicate balance of the desert ecosystem has suffered; cars driven on desert surfaces tend to destroy grasses, herbs, and bushes, and their increased numbers have contributed to an increase in the number of sandstorms. (See Al-Welaie, 1989, pp. 37-61.)

3.8 The Impact of Urbanisation and Development on the Oases in the Kingdom of Saudi Arabia

The impact of urbanisation and development on the oases of Saudi Arabia is a matter of major concern, because of the actual or potential loss of agricultural land, a valuable and non-renewable resource.

The Saudi Arabia oases have been affected by the sort of changes we have been considering, primarily because the expansion of urban areas, the increased demand for housing, the easier access, and a shortage of community facilities have increased the demand for land. That land has tended to be agricultural land of the type traditionally associated with oases.

When consideration is given to specific oases in Saudi Arabia some severe impacts can be seen. The oasis at Madinah in the western part of the country was once well known for its agricultural production due to the rich agricultural land which lay round the city. As a result of urban growth the quantity of agricultural land around Madinah declined from 1,500 hectares in 1971 to 1,277 in 1977 and to around 1,060 in 1983. (See Al-Yemeni, 1986 p. 227.)

Another example is the Al-Hasa oasis, which in fact consists of four small oases adjacent to each other, and covers a total area of about 20,000 hectares. It is the largest oasis in the kingdom. In the oasis there are 33 settlements, most of them surrounded by agricultural land, and others bordered on one or more sides by such

land. Palm trees and other fruit bearing trees, as well as vegetables, are grown. The discovery of oil in the Eastern Province had a great effect on its economy, its settlement pattern, and its social life. This oasis group suffered a great detrimental impact, with its agricultural land being reduced from 16,000 hectares in 1950 to 8,000 hectares by 1967 - a loss of 50% in only 17 years. Al-Hasa is still losing land to urban development (See Al-Fehaid, 1995, p. 11; Al-Noaym, 1998.)

Yet a further example of the loss of agricultural land being the impact of urbanisation is the case of Al-Qatif oasis, Saudi Arabia's second largest oasis, located in the Eastern Province. It consists of 25 settlements of various sizes, some of them surrounded by agricultural land, and some bordered with it on one or more sides. Before the discovery of oil Al-Qatif oasis played a most important role in sustaining agriculture and other economic activities in the region. It was in particular a source of food, especially dates, vegetables, and fish, and of pearls from the Gulf.

Al-Qatif's location on the Gulf means that it is an ideal centre for commercial activity. Its existence, however, has been under threat ever since the discovery of oil at Dhahran, some 30 kilometres away, and then at other locations in the eastern region. This was followed by great areas around Al-Qatif being handed over to ARAMCO for the exploration, and for the extraction, processing, and marketing of oil.

There have been very serious difficulties for the oasis following urbanisation and the industrial and commercial development that came in the wake of the discovery of oil. Agricultural land has been given over to urban settlement. Between 1965 and 1993, for example, the amount of agricultural land shrank from 7,534 hectares down to 5,798 hectares, and in this same period urban land development rose from 495 hectares to 5,080 hectares. This agricultural land lost to urban spread has gone forever, not just for a period while other land was being made over to agricultural use. Further attempts to satisfy the demand for urban development have been in the form of reclamation of the seabed, an operation which had a considerable detrimental impact on coastal ecology, with all its concomitant problems. If the development and re-use of land continues along the same lines, it can be assumed that Al-Qatif oasis and all its agricultural land will disappear within the next twenty to thirty years. (See Urban Planning Department, 1989; Al-Shihri, 1993; Al-Arfaj, 1994.)

The evidence indicated above shows that urbanisation and development have had a very serious detrimental impact on the natural environment in general, and on Saudi Arabia's oases in particular. Urban growth has resulted in the permanent loss of valuable agricultural land, located around the oases. Al-Soliman (1993) states:

> Saudi Arabia has achieved a very high degree of modernisation and development in an extremely short period of time. However, this unprecedented acceleration of social and physical development has brought about an equally rapid negative effect on the Saudi Arabian environment. (p. 220)

Development and urbanisation are very important goals in a society, but very serious problems arise when the level is reached where there is no equality and no sustainability, as has been discussed in Chapter One. There is therefore a need for sustaining and balancing urbanisation and development in oases areas. Spiertz, et al. (1994) write: 'Sustainable development is the guiding principle for solving economic problems.' (p. 58)

In Saudi Arabia it has not only been the increases in population, changes in settlement patterns, and the rise in living standards, but also the very speed with which these things have happened, that has affected the environment.

The Arabian peninsula was the birthplace of Islam, which has influenced human behaviour since the seventh century. Islamic teaching covers many areas of the man-nature relationship, and Saudi Arabia attempts to apply Islamic law in all areas of human activity.

Within Islamic teaching the relationship of the individual to the environment is governed by certain moral precepts. These originate with God's creation of human beings and the role they were given on Earth. The universe, with all its component parts, has been created by God, and mankind is an essential part. The role of human beings is not only to enjoy and benefit from nature; they are expected to preserve, protect, and promote other creatures. Islamic teaching encourages the utilisation of the natural environment, but it does not permit unnecessary destruction. The components of life have to be protected so that their utilisation may continue in a

sustainable way. The prophet Muhammed (PBUH) said: 'Act in your life as though you are living forever and act for the hereafter as if you are dying tomorrow.' (See Izzideen, 1990, p. 194.)

Despite the fact that the government of Saudi Arabia has, as we have seen, taken a hand in the control of urbanisation and development through its national, regional, and local plans, the pressure for continued urban, industrial and commercial development in order to accommodate the demand for land is so great that all oases in Saudi Arabia, in particular the Al-Qatif oasis, are under threat.

In connection with this Al-Ismail (1994) has stated:

> In the past development of land was carried out one way or another without any planning controls. Decisions about urban growth were made by the inhabitants themselves without any regard to building codes or regulations. . . . At present local planning consultants are being commissioned to carry out planning studies; such consultants do not seem to show due concern for the future of the oasis. (p. 102)

This chapter has clearly shown that there is, and has been, considerable urbanisation and development, yet neither of them is sustained. There are development plans, but on the other hand the oases are being lost. A number of questions seem to raise themselves in this connection, which require investigation:

- Is there a policy related to the protection of the oases against urban growth, since there are development plans and policies (national, regional, and urban)?
- Is there a direct control policy and tools to control land development so that it does not encroach upon the agricultural land of the oases, in order to define the approaches leading to sustainable development?
- If applicable, what impact does implementing these tools upon oases have?

3.9 Summary

This chapter has set out the physical background of the Kingdom of Saudi Arabia. We have noted the country's geographical, climatic, and geological features and its physiographic divisions. We have also noted briefly the Islamic background to legislation in Saudi Arabia.

We have seen how, within the space of little more than one generation, Saudi Arabia has been transformed, largely through the revenue from oil, from a basically rural society into a highly urbanised one, and we have looked at the stages of the plans and policies, especially the National Five-year Development Plans (NDPs), which the Saudi authorities introduced both to facilitate that urbanisation development and to deal with the impact of these processes. We have assessed the achievements of the first five of these NDPs and the impact of the government policies at a national and local level. The main achievements of the NDPs have been the consolidation of economic growth and stability, the diversification of the economic base of the country so that it would depend on more than oil alone, the development of human resources primarily through education and training, the expansion of the private sector, the development and sustaining of the country's physical infrastructure, and the increase of the standard of living and life quality of the Saudi people.

In addition regional and local development plans have also been implemented, concerned with establishing and consolidating the infrastructure and enhancing the quality of life. We have given a description of the government bodies involved in development planning in the Kingdom, and have taken in particular a close look at the economic development of Saudi Arabia in relation expenditure and to the output of the first five NDPs. As introduced each sector of the government has been increased and developed, and all of them have led to an improvement in the national economy. We have seen the relation of oil-based to non-oil based economic activity, particularly agriculture, in Saudi Arabia.

The chapter has discussed the impacts, both beneficial and harmful, of urbanisation and development in the country, ranging from the effect on urban housing provision to that on environmental matters. In particular the effect of urbanisation and development on the oases in Saudi Arabia has been described, since this has become a

matter of major concern. Agriculture has given way to urban settlement in the wake of the discovery of oil, and oasis land has been disappearing.

The rapid development of the Kingdom of Saudi Arabia in recent decades has brought considerable benefits, but the impact has not been entirely beneficial. One of these negative effects has been the loss of oasis land. There are development plans and policies, but questions have to be asked about whether the policies had a negative impact, and if they have not, whether they are being properly implemented.

Therefore the next chapter will discuss and assess Saudi environmental policies and the impact of these policies on the protection of the country's general environment and on the oases in particular.

Chapter 4

Environmental Policies and Documents

CHAPTER 4 Environmental Documents and Policies

4.1 Introduction

With the rapid urban growth that the Kingdom of Saudi Arabia experienced during recent decades there has been considerable impact on the environment in general and on oases in particular. The Saudi Arabian government, which has issued laws and regulations concerning the environment since the 1930s, has therefore stepped in and has established the basis for environmental policies, setting up institutions, ministries, committees, and agencies for the implementation of these policies.

In this chapter a history of environmental policies in Saudi Arabia, and the involvement of Saudi Arabia in the field of the environment at national and international levels will be introduced. Documents will be reviewed in general, and a specific focus will be aimed at environmental policies relating to land use planning. Finally the administrative bodies responsible for and involved in environmental issues will be presented, followed by the conclusion.

4.2 Environmental Documents and Policies

We have already noted in Chapter Three the series of five-year National Development Plans issued by the Saudi government, which constitute the most authoritative official documents on national development strategies. The first of the plans covered the years 1970-1975, and they have continued up to the present, sixth, plan covering 1995-2000.

4.2.1 National Development Plans

The objectives of these plans have been comprehensive, as they have included economic, social, and institutional dimensions in a co-ordinated way, covering all

development aspects. However, it is on the environmental issues with which they deal that we will concentrate in the following sections.

4.2.1.1 The First and Second National Development Plans

These plans covered the years 1970-1980. Their main objectives were to continue the steady expansion of the country's economy, to develop the basic infrastructures and expand supporting institutions, to maximise oil revenue while at the same time reducing economic dependence on crude oil, and to ensure the defence and internal security of the country.

The plans emphasised studies, programmes of research, and the collection of statistics which would provide the necessary information to exploit the development potential in all productive sectors, with the aim of diversifying the sources of national income. Many projects pertaining to environmental control and natural life preservation were referred to the agencies concerned. They included:

- Projects to improve pastures and conserve forests, and to develop the protection and administrative services dealing with them, so that they might recover their natural balance.
- Projects concerned with research into and protection of marine life, and with exploiting open water areas.
- The construction of dams and related water projects.
- Projects exploiting the conversation initiatives, so that the optimal use is made of the Kingdom's water, soil, and wildlife resources.
- Projects concerned with the creation of public gardens and parks.
- Specific projects for protecting and preserving wildlife, such as the creation of reserves for animals threatened with extinction, the publication of general information aimed at increasing the citizen's awareness about wildlife preservation, and the development of appropriate rules for the hunting of game.
- Projects pertaining to aerial photography of the surface of the whole country.

These projects helped directly and indirectly to preserve the environment and natural life, and controlled to some extent the environmental deterioration caused by development.

4.2.1.2 The Third National Development Plan

The main objectives of the third NDP were to accelerate the construction of the physical infrastructure and to lay the foundations for a more diversified economy. The plan included defined objectives for the production sectors concerning environmental and natural life preservation as follows:

Agriculture. Achieving the optimal exploitation of land and water resources, preserving agricultural and marine environments, and raising the level of range management by applying the procedures for safeguarding pasture land stated in Royal Decree No. M/22, dated 3/5/1398 A.H.

Water. Protecting the environment when exploring for, producing, or distributing oil and gas.

Energy. Utilising solar energy, and improving research to make even more use of it as a non-polluting source of energy, through the co-operation of King Abdulaziz City University of Science and Technology and other universities and research centres.

Meteorology and environmental protection. Supplying and developing comprehensive environmental services by determining and publishing information concerning air quality, water pollution, and the disposal of solid waste material.

In the third plan the objectives of these sectors were expanded to include and develop programmes and projects aimed at explaining the importance of the environment and the protection of natural life.

The agricultural section of the plan took in the following important projects:

- Increasing pasture area by fencing water distribution points and constructing fodder warehouses.

- Making an inventory of existing forests and reafforesting them at the rate of 25 hectares per year.
- Control of desert locusts and crop protection.
- The continued development of water resources by the construction of concrete and earth dams and other works.
- Ongoing research at the Pasture Research Centre at Al-Jowf aimed at the preservation of wildlife.
- Sand fixation projects in the Eastern Region.
- Tree planting in the main cities was to be increased, more wildlife parks were to be built, and Asir National Park was to be developed.
- The production of a general soil map of the Kingdom, showing the suitability of land for pasture.

The meteorology and environmental protection section of the third plan included the following projects:

- The issuing of appropriate standards for air quality and the protection of marine life.
- The preparation of field maps to show the characteristics of natural and coastal sites of sea water.
- The publishing of three volumes about wildlife in the kingdom.
- The establishment of the Environmental Protection Co-ordination Committee.
- The completion of Al-Jubail plant for pollution control, and its connection with the general network of MEPA (the Meteorology and Environmental Protection Administration).

The municipality section of the third NDP included the following projects:

- Rubbish collection and street cleaning.
- The establishment of environmental health laboratories.
- The provision of insect sprayers.
- Tree planting along roads.
- The construction of public parks.
- The construction of a green belt around municipalities.
- The filling in of swamp areas with earth.

4.2.1.3 The Fourth National Development Plan

The main objectives of the fourth NDP were to encourage diversification of the economic base and thus reduce dependence on crude oil income, to encourage the rapid development of the private sector as the main means of achieving this diversification, to complete the infrastructure projects necessary to reach long-term development goals, and to develop further the country's human resources.

The Fourth Development Plan strategy referred more than once to the importance of continuing the development of environmental preservation. The plan included the following policies and objectives:

- To safeguard the Kingdom's environment and protect the natural land, marine, and water resources from pollution and deterioration through determining the areas that were environmentally threatened, monitoring the environmental impact of pollution levels, and identifying the long-term trends in environmental deterioration.
- To improve the safety level and quality of life of the people through the provision of environmental services, by promoting a comprehensive set of environmental standards and taking the necessary measures for the monitoring, inspection, and surveillance of the environment Developing methods of controlling the discharge of pollutants, in order to protect land and water.
- To cause citizens, agencies, and institutions to take part in the conservation of the natural environment and heritage by publicising issues through the press and other media. To increase further the public awareness of environmental matters by publishing and distributing environmental reports and studies in educational circles, and by providing environmental data to industry and encouraging research institutions to carry out environmental studies.
- To enhance the efficiency and operational effectiveness of those concerned with the environment by increasing the number of training programmes, by using computers for processing environmental data, and by expanding communication capabilities.

The First and Second Development Plans, which included comprehensive guidelines relating to environmental protection, aimed to provide information and data about the environment in general and about some specific environmental issues, such as conserving and improving pastures and forests, conserving and managing water, soil, and wildlife resources, and constructing public gardens and parks. The Third and Fourth Plans continued to define the objectives for the preservation of the national environment and the protection of natural resources from pollution and desertification. They aimed also to encourage the participation of individuals, groups, and institutions in the maintenance of the environment and the natural heritage of Saudi Arabia. During this whole period - from the First Development Plan to the Fourth Development Plan - the government established the Meteorology and Environmental Protection Administration (MEPA) in 1981 and the National Commission for Wildlife Conservation and Development (NCWCD) in 1986.

4.2.1.4 The Fifth National Development Plan

This plan covered the period 1990-1995. Its main objectives were in effect a continuation of initiatives set in motion by earlier plans, but with less emphasis on infrastructure, which was by now largely in place, and more stress on the development of human resources and improving the quality of life for Saudi citizens. The confirmation of Islamic values, balanced growth, a continuation of economic diversification and the involvement of the private sector, the development of mineral resources, and social and economic integration with other countries in the region were amongst its goals.

The Fifth Development Plan acknowledged for the first time the environmental hazards associated with the previous (fourth) plan (1985-1990), and contained the most comprehensive assessment of environmental policies. Section 15.4 of the plan, headed 'Development and Environment', contained the environmental policies. It stated:

> Development and environmental protection should not be perceived as separate or conflicting challenges; both are inexorably linked. Development cannot flourish upon a deteriorating environmental resource base; neither can the

> environment be protected when development ignores the costs of environmental destruction. If economic growth were to take place at the expense of ever deteriorating environmental resources and conditions, the quality of life and the well-being of people . . . the ultimate goal of all development . . . would be seriously affected. Environmental neglect destroys assets that are vital to life itself. (cited in MCE, 1992, Appendix I, p. 1)

The Fifth Development Plan set the following long-term goals for the environment:

1. To upgrade the quality of life and the well-being of the people and to ensure a pollution-free environment, with fresh air, clean water, and healthy food.
2. To reach a position of sustainable development based on improving the management of available resources and the absorbent capacity of the environment, and the rehabilitation of elements of the environment previously subject to degradation and misuse (MOP, 1990).

The plan called upon all government agencies to co-operate in achieving the long-term goals through the realisation of the following objectives:

- To protect the environment and its natural characteristics and ecosystems and to safeguard natural resources.
- To protect and promote all forms of wildlife while maintaining the ecological balance and the diversity of the biological gene pool.
- To reach a sustainable balance between population distribution and environmental potential with due regard to the effects of population growth and consumption patterns on the natural resource bases.
- To provide enough energy at a reasonable cost using methods the least damaging to the environment.
- To hold in reserve, as far as possible, the non-renewable sources of energy while utilising the potential of clean and renewable sources, such as the sun and the wind.
- To obtain the highest level of industrial development through the use of the latest available technology which strictly adheres to the required protection standards at all stages of design, construction, and implementation.

- To realise the highest attainable degree of food security without harm to the environment, and to restore the resource base where environmental damage has been incurred (MOP, 1990).

The plan introduced some of the 'key issues' and constraints which required solutions during the period of the plan. These were:

- Environmental standards. There was a need for a clear set of environmental standards, regulations, specifications, and guidelines to be adhered to in industrial, agricultural, commercial, and urban activities.
- Environmental impact assessment. This was to become an integral part of feasibility studies for all proposed projects and programmes.
- Environmental awareness. Public awareness of the environmental ramifications in all aspects of daily activities was inadequate.
- Enforcement of environmental regulations. The enforcement of existing regulations was defective because there was no clear delineation of mandates, areas of responsibility, and authority to enforce them.
- Environmental monitoring. There was a need to develop and set in motion an effective system of monitoring pollution parameters and environmental damage.
- Co-ordination of activities relating to the environment. The activities of many government bodies had direct or indirect effect on the quality of the environment, and these activities needed to be co-ordinated for the best results (MOP, 1990).

The plan suggested the following environmental policies, to be put into operation during the period of the plan:

- Developing and enforcing a comprehensive set of environmental regulations.
- Establishing and implementing a system of environmental impact assessment in all projects undertaken by government agencies.
- Enhancing the technical capabilities to monitor and analyse information necessary to anticipate environmental damage, and take preventative measures.

- Maintaining and refreshing a continuous inventory of the country's natural and environmental resources, ecosystems, and wildlife.
- Reducing the detrimental environmental effect of transportation, especially in highly populated areas.
- Following through plans for the use of agricultural land, forests, pastures, and water resources with due consideration for the conservation of these resources for use by future generations and the prevention of their deterioration.
- Taking suitable measures to carry out the required liaison among the different agencies involved with environmental matters, and to enhance the Meteorology and Environmental Protection Administration (MEPA) role and mandate.
- Co-operating closely with other environmental-related organisations, both within GCC countries and in the wider international field (MOP, 1990).

As the main environmental protection body, MEPA had an important role in co-ordinating and putting into operation the policies of the Fifth Development Plan.

4.2.1.5 The Sixth National Development Plan

In general terms the main objectives of this plan (covering 1995-2000) are to continue with the measures of the fifth plan, and include integrating environmental policies with development policies and eliminating areas of disharmony between them.

The plan proposes that Saudi Arabia's basic environmental strategy should harmonise the planning, institutional, and management dimensions by the following methods:

- Achieving balanced sustainable growth while making the best possible use of, and extending the life span of natural resources, especially non-renewable resources.
- Maintaining a sustainable balance between population distribution and the absorptive capacity of the environment, with due consideration to the consequences of population growth and consumption patterns for the natural resources of the country.

- Taking the environmental dimension into consideration at all stages of designing and carrying out development projects.
- Maintaining Saudi Arabia's biological diversity and protecting its wildlife with the aim of keeping the ecological balance, particularly with respect to endangered animal and plant life.
- Providing environmentally clean energy for industry and lead-free petrol throughout the Kingdom.
- Increasing the part played by the private sector in the protection of the environment and the control of pollution, while encouraging investment in environmentally safe industrial and commercial activity.
- Concluding the setting up of a comprehensive national environmental database.
- Bolstering environmental education and public awareness. (MOP, 1995)

One of the objectives and basic strategic principles of the sixth plan is devoted to environmental issues; it is the plan's tenth basic proposal, which relates to:

1. Protecting the environment and preserving its natural characteristics, in addition to conserving natural resources.
2. Protecting and developing wildlife in Saudi Arabia, together with preserving the natural equilibrium of its ecology in terms of the genetic diversity of its zoological and botanical make up.
3. Maintaining continued equilibrium with regard to the most suitable population distribution and environmental integration, taking into consideration the impact of population growth and consumption patterns on natural resources.

Further, some of the significant areas of concern identified by the plan include the following:

- Air quality
- Indicators of sustainable development
- Waste disposal management
- Management of land use
- Management of coastal and marine areas
- Environmental information and data
- Fresh water resources.

The Sixth Development Plan also included these objectives and policies:

Objectives

- To preserve and develop the environment and protect it from pollution.
- To enhance the quality of life of the country's population and to ensure a clean environment.
- To reach a position of sustainable development through conserving natural resources, while reducing pollution and guarding against the over-use of such resources.
- To conserve and develop Saudi Arabia's wildlife and to maintain the biological diversity which is an integral part of the Kingdom's natural resources, within a framework for arriving at a balance between environmental and economic considerations, in addition to preserving rare and endangered plants and animals.

Policies

- To adopt a proactive preventative approach which reduces environmental deterioration and pollution.
- To put in place a national system for environmental impact assessment to be used in projects undertaken in the various development sectors, especially in industrial, agricultural, and urban projects.
- To establish an integrated set of environmental standards and specifications, and to update them as required and according to the progress made within the context of an integrated environmental system at national level.
- To give due attention to environmental matters in the various stages of development projects in all sectors.
- To take suitable steps to maintain biological diversity, preserve wildlife, and manage natural resources in line with the concept of sustainable development.
- To enhance environmental management and co-ordination nationally by devising and publicising of a national environmental code.
- To research the viability of an environment unit within each environment-related agency to co-ordinate the environmental tasks within the agency, the

MCE (Ministerial Committee for the Environment - established in 1990) and the MEPA.

- To bring the private sector to see the need to participate in environmental activities and to advance the investment of environmentally oriented activities and the use of environmentally safe technologies.
- To attract environment science personnel into the government and private sectors.
- To set up and run the protected areas in a way that sustains the Kingdom's wildlife and maintains the diversity of botanical and zoological species and other natural resources.
- To prepare a comprehensive national environmental awareness plan.
- To support research into the proliferation and breeding of various wildlife species in order to ensure their continuity in their natural habitats.

The Fifth and Sixth Development Plans have a comprehensive set of environmental policies with a sustainable development goal; these policies, though, do not address specifically issues connected with the protection of oases. However, there are policies which emphasise the protection of land and the management of land use. Such policies encompass establishing environmental impact assessment, achieving a balanced sustainable growth while making the best use of and extending the life span of natural resources (particularly non-renewable resources), and keeping a sustainable balance between population distribution and the absorptive capacity of the environment with regard to the effect of that growth and the population's consumption needs on natural resources.

Furthermore, the Fifth and Sixth Development Plans have picked out important concerns requiring solutions during the plan periods, such as the management of land use and of coastal and marine areas. The sixth plan contains the EIA system, and the agricultural and urban projects are included in this proposed EIA system along with a recognition of the need for guidelines for urban activities affecting the environment. A. Al-Gilani and S. Filor (1997) state:

> The Fifth Development Plan gave an excellent account of existing problems through its "key issues" and established a clear policy direction for environmental issues . . .

> unfortunately most of the proposed policies were not achieved during the plan period. (p. 777)

4.2.2 State of the Environment Reports

In 1984 the first State of the Environment report (SOE) was published in Saudi Arabia, prepared by a foreign consultant and sponsored by MEPA. It indicated the environmental problems in the country and their causes. The second SOE appeared in 1989, in two volumes. The first volume gave an overall picture of the activities being undertaken in the fields of pollution control and environmental protection (amongst them the protection of wildlife, the development of parks, surveys of coastal areas, emission control, and a monitoring study of the environmental and economic ramifications of introducing low-lead and lead-free petrol). The second volume contained a detailed discussion of institutional arrangements - national, regional, and international. In general there was no mention of direct or indirect policies related to oases, and notwithstanding that this purported to be a report on the state of the environment, there was nothing on land issues or on the environment in general. Al-Gilani and Filor (1997) state:

> The report consisted of coloured photographs of wildlife and the Saudi landscape; the text produced no information on the state of the environment. This edition of SOE did not aim to provide information on the environmental conditions and stress, but to make available a colourful booklet advertising MEPA and NCWCD activities. (p. 780)

In 1992 the MCE drafted an SOE report (SOE 92), which underwent re-writing to appear as the national report to the UN Conference on Environment and Development (UNCED) held in 1992 in Rio. This report (NRUN) consisted of seven chapters and two appendices and described many environmental concerns in Saudi Arabia and how the government was dealing with them, as well as the international agreements to which Saudi Arabia was a party.

In Chapter 5 of this report ('The Sectoral Analysis of Education, Health, Transportation, and Municipalities') at section 5.4 ('Municipalities') it was stated that human settlements in any form threaten the natural environment in a number of ways.

In practice even the most environmentally considerate developments will somehow have a potential adverse effect on the environment and natural resources. However, it is also part of organised urbanisation to protect and even enhance environmental resources as an essential ingredient of the sustainability of the urbanisation process itself. In the Kingdom it is mainly the responsibility of the Ministry of Municipal and Rural Affairs (MOMRA) and its municipal affiliates to keep to a minimum environmental damage caused by urbanisation, a goal which is accomplished through spatial development controls.

In addition the report introduced the areas of environmental concern. When dealing with urban planning it stated:

> In urban planning, environmental aspects are given wide consideration through confining urban expansion only to the necessary land area and by preserving and developing the landscape. (MCE, 1997, pp. 69-70)

4.2.3 The Recommendations of the Conference on Environment and Development

The Conference on Environment and Development took place in Saudi Arabia in March 1990, sponsored by MEPA. The conference made recommendations in the following fields, which were included in a government policy document:

4.2.3.1 Industrial Development

It was recommended that concern should be focused on the following:

1. Carefully observing environmental considerations in selecting the location of industrial sites in order to avoid a damaging impact on the population, natural resources, and sensitive natural environments.
2. Controlling urban expansion towards industrial zones.
3. Supporting the principle of environmental assessment for all industrial projects, and making sure that environmental assessment studies were carried out in the context of project feasibility studies for presentation to the authorities concerned.

4. Using the best available technology in the control of pollution and the rationalisation of resource utilisation during all phases of industrial design, establishment, and operation.
5. Ensuring that industries and industrial practices correspond to the permitted environmental standards.
6. Providing and using low-sulphur fuel in desalination plants, power stations, and industries using petrol-based fuel.
7. Working towards the establishment of environmental industries based on the recycling and safe disposal of waste.
8. Giving added impetus to the preparation of the national code on the handling, processing, and disposal of waste and dangerous materials. A draft of this code had already been reviewed by government personnel for submission to and approval by the Council of Ministers.
9. Co-operating with MOMRA regarding the disposal of hazardous industrial waste in municipal pits not originally intended for such a use.

4.2.3.2 Agricultural Development

It was recommended that concern should be focused on the following:

1. Developing and completing databases on soil, plant cover, and animal and fodder resources.
2. Developing and putting into operation long-term national plans, with phased objectives, in respect of (a) the production and usage of water, taking into account the scarcity of resources and the needs of the next generation, (b) the saving of soil resources from deterioration, (c) the maintenance and development of forest cover, and (d) the protection and development of pastoral land, and the judicious use of pastoral resources within their renewable limits.
3. The sensible development of land and marine animal resources compatible with their sustainable limits.
4. The judicious use of chemicals in fertilisers, herbicides, and pest control, bearing in mind the possible negative effects on the environment and on plant, animal, and human well-being.

4.2.3.3 Urban and Rural Development

It was recommended that concern should be focused on the following:

1. Taking account of the environment in relation to urban development, town planning, and management, and also appreciating the general application of the particular experience and pioneering achievements of the High Commission for the Development of Arriyadh and the Royal Commission for Jubail and Yanbu in this field.
2. Co-ordinating industrial and physical planning activities to eliminate the negative effects of pollutant substances with potential health risks.
3. Increasing the number of sewage and water treatment facilities, and intensifying the use of treated water to enlarge the amount of irrigated land. These facilities were to be located in or near towns and villages, as well as in the buffer zones between industrial and residential areas.
4. Taking the environment into consideration when giving permission for residential or public building schemes, with particular regard for the fitness of design and construction materials to the different environmental and climatic conditions of the different parts of the country. This was also directed at reducing energy consumption through better building design and operation.
5. Making use of traditional environmentally friendly building designs and techniques, adapting them where necessary to current needs.
6. Taking advantage of local committees, in collaboration with MOMRA and other authorities, to increase environmental awareness and to promote local public participation in environmentally helpful activities, such as pollution control, and proper land and resource use.
7. Maintaining a proper balance between population and environment so that sustained development could take place. Concomitant with this there was a need to combat rural migration to cities by means of the development of rural communities.

4.2.3.4 Environmental Regulations

It was recommended that concern should be focused on the following:

1. Appraising and reviewing the rules and regulations pertaining to the environment, to its management, and to the safeguarding of natural resources. If necessary these rules and regulations were to be updated and they were to be published in a comprehensive way and adhered to in all development enterprises.
2. Producing a set of criteria to asses in particular the impact of projects. This would lay down what yardsticks should apply in the procedures to be followed before, during, and after the undertaking of evaluation studies in relation to projects.
3. Setting up a special code of practice on hazardous and toxic materials, co-ordinating work between government agencies and industry in order to improve the handling, storage, and disposal of such materials.
4. Improving environmental control by industry and ensuring that industrialists put environmental protection measures into application.
5. Adherence to all regional and international commitments by Saudi Arabia in setting up environmental rules and regulations and in creating and carrying through environmental policies.
6. Specifying and defining all means of co-operation between government bodies or development agencies and MEPA in relation to environmental conservation, and the strengthening of MEPA's powers in this area.

This government recommendation document also included various other proposals on such matters as cultural development, as well as suggestions regarding the protection of wildlife habitats. It further advocated organising special seminars on environmental issues, making use of regional and international initiatives to enhance education on various areas of environmental protection, and publicising the recommendations of the conference which gave rise to the document in order to share its benefits and to increase co-operation with international environmental organisations (MEPA, 1990).

4.2.4 Agenda 21: Saudi Arabia

Agenda 21: Saudi Arabia is a policy document based on the Rio 1992 recommendations. It was approved in 1995 and MCE advocated that its plans and policies should be taken into consideration at the level of national planning. Amongst those plans and policies were programmes emphasising the protection of natural resources in general and agricultural land in particular from the destructive effects of various users. In relation to urban planning Agenda 21: Saudi Arabia suggested the following:

- Initiating comprehensive updated land use planning with a view to evaluating land use changes in the future.
- Working together with other government agencies involved in land use planning.
- Reviewing land develop regulations, introducing improvements and new approaches where necessary.

Further, in relation to agriculture, water, and natural resources Agenda 21: Saudi Arabia made the following important points:

- Land use should be supervised so that agricultural land is protected and prevented from being transferred to other uses through providing stringent regulations; any land use changes in the future should be monitored and evaluated.
- Comprehensive programmes to plan and manage land resources should be introduced (MCE, 1995).

Concern with land use on this scale, combined with an emphasis on environmental issues, is a new phenomenon in Saudi Arabia, for it is clear from the text of Agenda 21 that great significance is placed upon controlling land, managing land development, and also on protecting natural resources. The newness of this emphasis is highlighted by Al-Gilani and Filor (1997) who state that no evidence is available to indicate that the measures recommended in Agenda 21 will be carried out in the near future.

4.3 The Environmental Ministries, Agencies, and Committees

The involvement of some of these bodies in environmental affairs has already been indicated to some extent by the discussion in this chapter above. This section gives some brief further information about their background.

In 1990, as a result of the increasing involvement of the government in international committees and agreements, the Ministerial Committee for the Environment (MCE) was set up. The MCE reviews international agreements and declarations, represents the views of Saudi Arabia on international committees and at international conferences, and approves local policies and legislative measures.

The Meteorology and Environmental Protection Administration (MEPA) was established in 1981. As the main national environmental authority it has a wide remit and carries out activities such as environmental research and surveys. It proposes laws aimed at monitoring and managing pollution levels, controlling land and sea nature reserves, and setting up environmental standards.

A further body set up by the government is the National Commission for Wildlife Conservation and Development (NCWCD), constituted in 1986. The NCWCD has become the main agency responsible for nature reserves and wildlife conservation.

The Environmental Protection Co-ordination Committee (EPCC) was established in 1979 and began to function two years later. The rationale behind it was that this committee was to be the national co-ordinating body for environmental policies, and that it was to act as the transition point, involved in the study and preparation of potential legislation before it is passed to the Council of Ministers for final approval.

The EPCC is chaired by HRH the Second Deputy Prime Minister, who is also the Minister for Defence and Aviation and the Inspector General. The position of Secretary General is held by the President of MEPA, and other members have the rank of Deputy Minister or higher; the following bodies are represented:

- The Ministry of the Interior

- MOMRA
- The Ministry of Industry and Electricity
- The Ministry of Planning
- The Ministry of Health
- The Ministry of Petroleum and Mineral Resources
- The Ministry of Agriculture and Water
- The Ministry of Transport
- The Ministry of Commerce (Saudi organisation for standards) and
- King Abdulaziz Centre for Science and Technology.

The specific responsibilities of EPCC are to:

- Consider all measures submitted by MEPA in relation to environmental protection and forward them the Council of Ministers for approval.
- Adopt studies and reports submitted by MEPA.
- Adopt regulations and instructions to be followed by all government bodies in different parts of the Kingdom and to submit them for approval to the Council of Ministers.
- Decide upon the measures and instructions applicable only to certain organisations.
- Approve MEPA plans, policies, and projects for environmental protection.
- Instruct MEPA in regard to the availability of environmental protection studies and information.
- Co-ordinate environmental activities among concerned organisations with Saudi Arabia (MEPA, 1989).

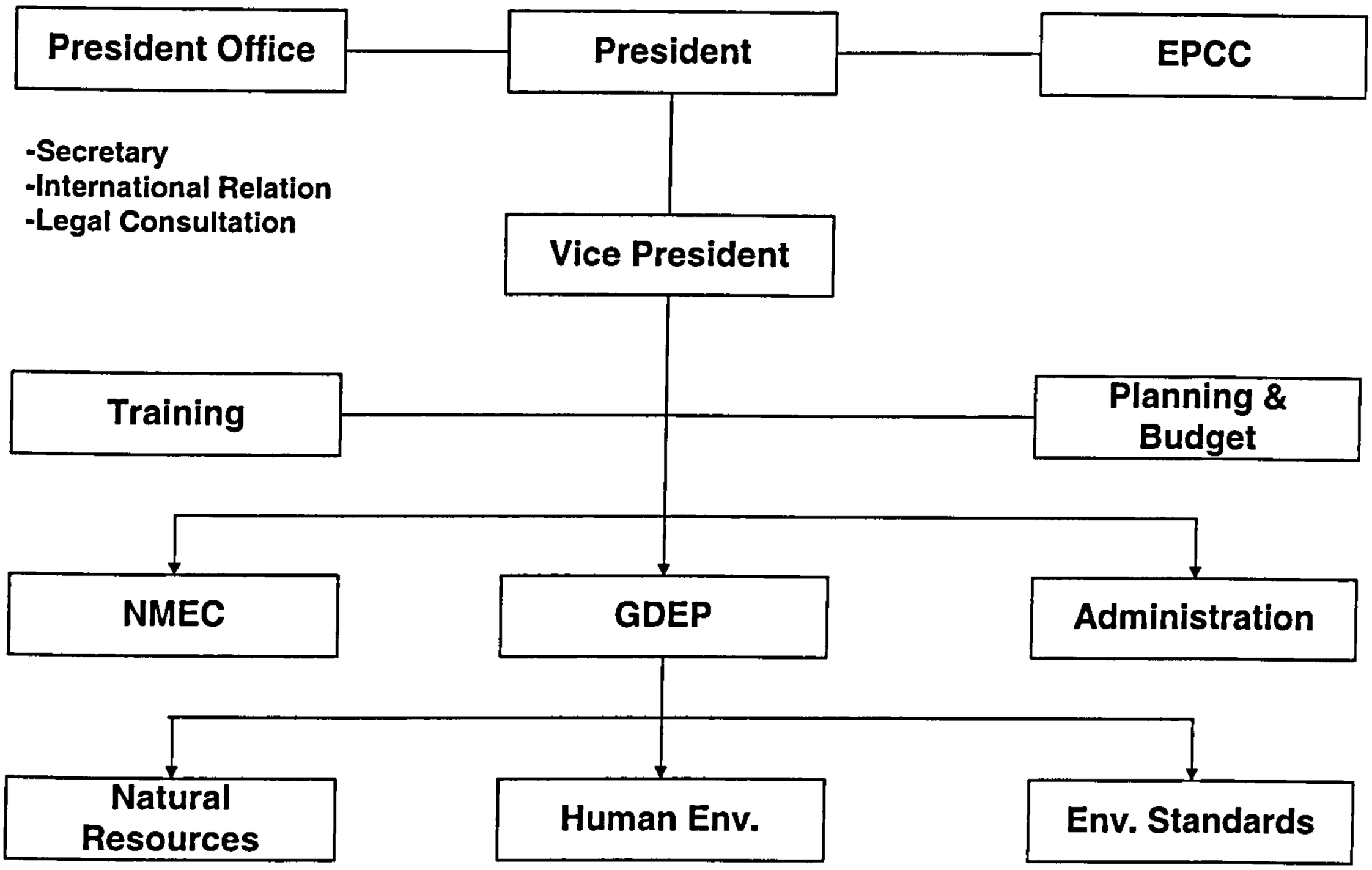

Figure 4.1: MEPA administrative structure.
Source: Al-Gilani, (1997).

EPCC: Environmental Protection Co-ordination Committee.
GDEP: General Directorate of Environmental Protection.
NMEC : National Meteorological and Environmental Centre.

MEPA is the main agency to which the control of pollution and the protection of the environment are assigned, in addition to its activities in meteorology, it will carry out the functions stated below according to Royal Decree No. 7/M18903:

- Conduct environmental surveys to define problems and recommend environmental standards and measures.
- Recommend protection regulations and measures dealing with environmental problems.
- Recommend practical measures necessary to deal with emergency situations affecting the environment.
- Assess existing environmental pollution levels and likely future variations (such information to be documented for easy retrieval).
- Establish environmental standards and specifications for pollution control and environmental protection in a definite and stable form to be considered by the appropriate authorities when issuing permits for industrial

and agricultural projects with a potential environmental impact Al-Gilani, 1997, p 253).

The MEPA structure has three main branches:

- General Directory for Environmental Protection (GDEP)
- National Environmental and Meteorological Centre (NMEC)
- Administration (AD)

NMEC has been delegated the duties of preparing and issuing environmental and meteorological forecasts and periodical reports according to the needs of clients. The centre consists of four departments:

- research, analysis, and forecasting
- meteorology.
- monitoring and methods.
- regional management.

The GDEP is responsible for environmental protection matters such as the issuing and implementation of standards and the evaluation of environmental conditions, especially as indicated below:

- Prepare and recommend environmental quality and source standards and the necessary implementation procedures for their application.
- Submit reports of environmental impacts of major projects in Saudi Arabia.
- Provide support and technical advice to those engaged in industrial and agricultural activities so that they may be able to comply with environmental standards.
- Submit reports on the state of the environment and follow up on the application of environmental standards and their effects.

GDEP consists of three departments:

- Environmental Standards (ES)
- Human Environment (HE)
- Natural Resources (NR).

The following lists the duties of the three departments:

Environmental Standards Department (ES)

- The continuous follow up of environmental problems and their mitigation used in other countries, in addition to any new environmental standards and monitoring techniques, in order to evaluate their suitability for application in the Kingdom.
- Proposing environmental standards and monitoring techniques for pollution sources at regional and national level.
- Proposing the necessary studies and research work to develop and formalise environmental standards.
- Studying the economic impact of environmental standards and pollution control mitigation, and proposing suitable solutions, taking into consideration the economic consequences in addition to environmental impact.

Human Environment Department (HE)

The responsibility of this department is limited to:

- Monitoring and evaluating reaction to environmental changes in the human environment and settlements.
- Proposing solutions to harmonise human environment with environmental conditions.

Natural Resources Department(NR)

This section is responsible for:

- Studying and assessing pollution impact and unregulated activities(from environmental point of view) on natural resources.
- Proposing mitigation methods to protect natural resources and protect ecological balance (Al-Gilani, 1997).

4.4 Summary

In this chapter we have set out how the Saudi Arabia government has drafted and passed laws and regulations related to the environment. The rapid urban growth that

the Kingdom experienced in recent decades brought with it environmental problems (as discussed in Chapter 3), so that the government took the initiative and established a basis for environmental programmes and regulations, and set up the various ministries, institutions, committees and other bodies for the application of its environmental policies. Internationally, Saudi Arabia has taken part in all the meetings of the preparatory committee of the UN Conference on Environment and Development. Nationally the government has set up the Five Year Development Plans, which have included environmental policies, and have issued other reports and papers as discussed above in this chapter.

This chapter has demonstrated how the government drafted and introduced environmental policies and controls. However, these were not comprehensive and have yet to be fully implemented. This is also the view of W. Zahid (1998), who argues that, while a great effort in the area of environmental concern has been made by the government, much has still to be done to put policies, programmes, and regulations into operation. Environmental strategies, to a large extent, are still at the preparation stage; they need both to be made more wide-ranging and to be put more fully into practice. Gilani and Filor (1997) state: 'Legislation is not yet comprehensive, and several important areas still need to be covered.' (pp. 786-787)

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Figure 4.2. The importance of sustainable development and some environmental problems related to the general environment and the physical environment in particular are expressed and highlighted in a recent edition of a Saudi newspaper.

(1) Complains from local residents in the media, that their houses have been located in an area where it is frequently flooded.
Source: Al-Jazeera newspaper, No. 9337, 1998.

(2) HRH Prince Sultan Bin Abdulaziz Al-Saud, in his speech entitled 'Human Beings and the Environment' at the symposium 'University and Society Week', at King Saud University, where he explained the importance of the environment and the achievement of the Saudi government in the field of development and the environment, and emphasised the protection of the environment and the need to sustain development in Saudi Arabia.
Source: Al-Riyadh newspaper, No. 10899, 27 April 1998.

(3) The public newspaper showing the new policies established by HRH Prince Abdullah Bin Abdulaziz Al-Saud, setting out the banning of the distribution of coastal land to private individuals or public bodies for development up to a distance 400m inland in all of the Kingdom's coastal areas.
Source: Al-Jazeera newspaper, No. 9367, 22 May 1998.

(4) The responses of the officials and businessmen and the people involved in the recreation sector to HRH Prince Abdullah bin Abdulaziz Al-Saud's new policy of banning the distribution of coastal land for development up to 400m inland. The article explains how this will have a positive impact on the public who live in Saudi Arabia as the coastal area plays a very important role as the lungs of every city.
Source: Al-Jazeera newspaper, No. 9368, 23 May 1998.

(5) Another newspaper points out the importance of the environment in the Kingdom of Saudi Arabia and the speech entitled 'Human Beings and the Environment' of HRH Prince Sultan Bin Abdulaziz Al-Saud at the 'University and Society Week', in King Saud University. In his speech HRH pointed out the importance of the environment in the Kingdom of Saudi Arabia, and the role of the Islam in the protection of the environment.

Source: Al-Yaum newspaper, No. 9081, 26 April 1998.

(6) HRH Prince Sultan Bin Abdulaziz Al-Saud in a newspaper report pointed out the issues and the achievements in the field of the environment in the Kingdom of Saudi Arabia at the national and international level.
Source: Al-Jazeera newspaper, No. 9371, 26 April, 1998.

(7) An article in the local newspaper entitled 'The University, Society, Human Beings and the Environment', showing the importance of the role of the university in society in relation to issues of the environment.
Source: Al-Riyadh Newspaper, No. 10899, 27 April 1998.

(8) The new policies established by HRH Prince Abdullah Bin Abdulaziz Al-Saud, No. 1445 in 28/1/1419 H (1998). These set out the banning of the distribution of coastal land to private individuals or public bodies for development up to 400m inland in all of the Kingdom's coastal areas.
Source: Al-Jazeera newspaper, No. 9370, 25 May 1998.

(9,10,11) The responses from the officials, businessmen and the public in Tabouk city in the north of the Kingdom of Saudi Arabia to the new policies, and how these will protect and control the use of the coastal areas and provide the best services for the public.
Source: Al-Jazeera newspaper, No. 9383, 7 June 1998.

(12) The responses from the officials, businessmen and the public in the Eastern Province to the new policies and how they will support the balance between development and the protection of the environment.
Source: Al-Jazeera newspaper, No. 9368, 24 May 1998.

Furthermore the policies discussed in this chapter are clearly not policies related specifically to the protection of oases, whether development or environmental policies. Verification of this can be provided by the standpoint of the Directorate of Research and Studies in the Ministry of Municipal and Rural Affairs (MOMRA) in1992. Despite the considerable importance attached within Saudi Arabia to environmental issues, such as the conservation of natural resources, measures related to agricultural land, air quality, and the improvement of hygiene, and despite the setting up of the MCE, MEPA, and other bodies at a national level, there has been very little activity on the part of MOMRA to apply these concerns at rural level (including oasis level).

In recent years both the public and the private sectors have begun to develop greater awareness of and a more positive attitude to the environment, as can be seen from the sporadic emergence of many fragmented and unco-ordinated organisations and programmes, mainly concerned with the preservation of the natural and traditional environments and some culturally significant archaeological sites.

However, within the environmental policies discussed in this chapter there are policies, identified by the Five Year Plans and other documents, which relate to urban

and physical land use planning. In the fifth and sixth plans a main objective is establishing and implementing a system of environmental assessment in all projects undertaken by government agencies, and indeed the aim to achieve sustainable development is highlighted explicitly in the sixth plan (MOP, 1990; MOP, 1995).

Other policies related to physical planning, such as the management of land use, have been introduced in the sixth plan and other documents, such as the national report to the 1992 Rio UN Conference on the Environment and Development (UNCED). This document speaks of the need to control the amount of land given over to urban expansion (MCE (1992) pp. 69-70). This has not been applied, however, in oases, where a vast amount of available land has been lost forever to urban growth.

Recommendations of the UNCED also included bearing in mind environmental considerations when issuing licences for residential and public building schemes.

Agenda 21: Saudi Arabia emphasised, in the field of urban planning, the importance of comprehensive land use planning, and the updating of land use plans in such a way as to help evaluate land use changes, and to introduce new measures and techniques.

The amount of damage to the environment, which means that Saudi Arabia is using up its natural resources, and the increasing gap between land use and the capacity of the environment to bear the burden placed upon it constitute a major threat to physical development.

In this chapter environmental policies have been analysed in order to comprehend their context, dimensions, and goals. It has been shown that, while there has been a certain amount of success in environmental policies introduced in Saudi Arabia at the national level, the position is very different at a local level. There, the picture is one of failure to implement policies and programmes. Furthermore, there is in fact a lack of such policies and programmes specifically aimed at oases, and what there is in this regard is at a primary stage.

The problem of the loss of agricultural land in the oases means that agricultural policies, plans, and programmes, both former and current, need to be assessed and analysed. A very important government sector, the Ministry of Agriculture, has direct

responsibility for the development of the agriculture sector in the Kingdom of Saudi Arabia, and this relates closely to what has been happening in the country's oases. There is a need to understand what is involved in oasis development and protection, to understand the relationships between the Ministry of Agriculture and other government sectors, and finally to understand and point out the agriculture-related factors which may result in a negative impact on the general environment in Saudi Arabia and on the oases in particular.

Therefore the next chapter will introduce and assess the agricultural and water policies in Saudi Arabia.

Chapter 5

Agriculture and Water Policies

CHAPTER 5 Agriculture and Water Policies

5.1 Introduction

Saudi Arabia's topography is essentially an expanse of desert; of the country's one million square miles only 1.3% is suitable for settled agriculture. Historically, agriculture in Saudi Arabia was carried out both by settled agriculturalists and by semi-nomadic Bedouins who, in the better-watered areas, practised cereal cultivation as a supplement to animal husbandry. The change in Saudi society from its pre-industrial agrarian and pastoral nature to an urbanised developing society has come about at the expense of its traditional economy. The increase in oil revenues, on the other hand, has led to some benefits for the agricultural economy, which has been boosted to become one of the most productive sectors in the Saudi economic scene. This has been due in some part to the National Development Plans, which have striven for improvement and promotion in the area of agriculture. The development policies of these plans, however, have also led to some environmental problems.

In this chapter Saudi Arabia's agriculture and water policies will be examined in order to understand their impact on the environment in general, and on the disappearance of oases in the Kingdom.

5.2 The Objectives of Agricultural Development in Saudi Arabia

From the first to the current (the sixth) of the National Development Plans (1970-2000), already discussed in Chapters Three and Four, the government has sought, amongst other objectives, to develop and expand the agricultural sector. In this respect the fourth, fifth, and sixth plans (1985-2000) reiterated the commitment of the first three plans. One major national objective of the government's strategy is:-

> To continue restructuring the Kingdom's economy through continuing diversification of the economic bases, particularly through laying more emphasis on industry and agriculture. (MOP, 1985, p. 191)

We will now introduce the agriculture development policies and objectives through the National Development Plans.

5.2.1 The Second and Third Development Plans (1975-1980, 1980-1985)

The second plan was concerned with assuring the defence and the internal security of the kingdom and maintaining a high rate of economic growth. It sought to maximise earnings from oil over the long term while at the same time reducing economic dependence on the export of crude oil. It also aimed to increase the well-being of all groups within society and foster social stability under circumstances of rapid social change, and to develop the physical infrastructure to support the achievement of these goals. The third plan had as its main intentions to accelerate the construction of the physical infrastructure and to continue with the foundations for a more diversified economy.

The major objectives as set out in the second and third plans, so far as agriculture and water matters are concerned, can be summarised as follows:

<u>Political and Social Objectives</u>

The Saudi government were acutely aware of their vulnerability to the so-called 'food weapon', should any external supplier of food choose to use it against the Middle East in general or Saudi Arabia in particular. The government were therefore concerned to reduce dependency on crucial externally-supplied food commodities, such as wheat.

<u>Economic Objectives</u>

Saudi Arabia was the largest importer of agriculture produce in the region in the year 1984. That year the country paid $5.7 billion to buy food for a population of just 10.4

million. Furthermore, diversification in economic policies sought to break away from dependence on the fluctuating oil sector, which was dominating the economic scene. One factor in this diversification was the development of agriculture and the promotion of what may be termed agro-industry, so that there was less reliance on imported foodstuffs.

Regional Development Objectives

The benefits of oil revenue did not reach some regions, and by targeting them the Saudi government was able to implement rural development and an improvement in socio-economic conditions. Agriculture products and services were provided to affected underprivileged areas. The aim of this was the eventual halting and even reversing of the trend towards urban migration, thus creating a better balance between rural and urban conditions. Employment opportunities in rural areas would also be enhanced.

Technological Objectives

The government aimed to introduce the latest agriculture technology in irrigation, water use, and machinery and new approaches to agriculture in order to ensure the continuing provision of the sector. Problems the government had to face included lack of trained labour, scarcity of water, and low soil fertility. These were obstacles to agriculture development. The government sought capital-intensive high-technology joint venture means of production.

Ecological Objectives

The government also sought the improvement of water resources through a raft of conservation measures, dune stabilisation, and countering desertification through soil and land management. Agriculture development could reach production objectives while improving the ecological condition of the land (Joma, 1991).

5.2.2 The Fourth Development Plan (1985-1990)

The fourth plan was concerned with the continuation of structural change in the economy in order to diversity the economic base and thus reduce dependence on crude oil income, with encouraging the rapid development of the private sector as the main instrument for achieving this diversification, with the completion of the infrastructure projects necessary to reach long-term economic and social development goals, and with developing further the country's human resources.

Objectives

- To achieve a satisfactory rate of increase in farm output at minimal cost through encouraging innovations which would exploit the possibilities for technological change most suitable for the country's natural capacities.
- To achieve a broadly-based improvement in the welfare of the rural population.
- To increase the production and marketing capability of agriculture producers and to attract private capital investment into agriculture through offers of easy-term loans (MOP, 1985).

Policies

Amongst the fourth plan's major policies aimed at reaching the above objectives were the following:

- Following information gained by means of land classification surveys, cultivation assistance would be given only to those areas with high-potential renewable water resources. Areas with substantial ground water depletion rates would be picked out and regulations would be introduced in respect of water utilisation and acreage for specific crops.
- There was to be a continuation of agricultural input and service programmes, including those dealing with the distribution of seeds, seedlings, and insecticides. There was to be an increase of extension services to agriculturalists.
- Existing irrigation and drainage systems were to be improved in order to optimise water usage.
- Greater mechanisation in farms was to be promoted.

- Resources were to be made available for research work on matters relating to agriculture and suitable modern technology.
- Attention was to be paid to agriculture marketing strategies and channels. For example, there would be improved storage facilities for farmers. Further, information would be gathered and disseminated on agricultural production and the costs of various agricultural commodities, and market studies would cover supply and demand predictions.
- Inter-regional co-operation in the production, storage, and marketing of foodstuffs (including fish) would be promoted through joint studies with GCC members countries.
- Provision would be made for a six-month stockpile of wheat through an increase in the storage capacity of grain silos.
- The shortage of skilled labour would be dealt with by the intensified training of agricultural manpower, especially in relation to the operation and maintenance of agriculture machinery.
- Various types of financial loans would be provided to meet the needs of both the small farmer and the large-scale operator. Furthermore, the monitoring of loans would be improved to ensure that cash loans were in fact used for specific projects (MOP, 1985).

5.2.3 The Fifth Development Plan (1990-1995)

The fifth plan was concerned to safeguard Islamic values in the Kingdom, to defend the faith, and uphold the security and social stability of the country. With much of basic infrastructure now in place it was able to concentrate more on improving the quality of life for Saudi citizens by encouraging them to take employment and training advantages now offered by the state. It aimed at the production of a national workforce and developing the nation's human resources pool, thus ensuring a constant manpower supply. Economically, it sought to continue the reduction of dependence on crude oil as Saudi Arabia's main source of wealth, to continue with real structural changes in the economy so as to sustain the movement towards a diversified economic base, to develop mineral resources and encourage their discovery and utilisation, and

further to encourage private sector participation in socio-economic development, so that there could be reached a balanced growth in all regions of the kingdom.

Objectives

Included amongst the objectives relating to agriculture as stated in the fifth plan (1990-1995) were these:

- To contribute to the security of the nation's food supply through the diversified production of cereal, animal, vegetable, and fish products, and commodities that were appropriate to the Kingdom's available natural resources, and subject to the long-term use of water.
- To achieve satisfactory growth in yields for major farm products, so as to minimise costs and lower water consumption per unit of output.
- To achieve a satisfactory rate of growth in agricultural labour productivity.
- To make a significant contribution to the creation of job opportunities for rural dwellers, and to improve their welfare.
- To attain a high level of efficiency in production and marketing throughout the sector p (194).

Policies

The following are the major policies aimed at attaining the objectives of the fifth plan stated above:

- Land was to be distributed only in areas with high-potential renewable water resources, areas with appropriate water pumping rates, and the areas picked out for cultivation.
- There was to be a provision of agricultural inputs and support services to farmers, including agricultural extension services and the supply of seeds and seedlings. Marketing channels were to be improved by the greater provision of storage facilities for crops like potatoes and other perishable vegetables. Methods of promoting private marketing initiatives were to be studied.
- Training was to be provided for agricultural manpower to develop and enhance their skills in various areas of specialisation.

- The cultivation of feasible new crops was to be encouraged (including oil-bearing crops such as sunflower and corn). Greenhouses were to be used in the growing of vegetables and an increased emphasis was to be put on fishing. Tariffs to protect the domestic producer against dumping by foreign competitors were to be used when necessary.
- The collection of data and the dissemination of information about agricultural resources, prices, production, and the costs of commodities was to continue.
- There were to be regular reviews of agricultural support prices to promote optimum cropping patterns and the prudent diversification of agricultural production.
- A sufficient volume of short-term loans would be provided for agricultural production.
- The private sector was to be encouraged to establish animal feed plants using imported raw materials, in order to attain a prudent level of meat production at a relatively competitive cost with the optimum use of local raw materials.
- Joint studies with other GCC member countries were to be conducted to promote inter-regional co-operation in the production, storage, and marketing of the main food items, including fish products, and implement workable related ventures (MOP, 1990).

5.2.4 The Sixth Development Plan (1995-2000)

The sixth Development Plan is concerned with enhancing and broadening the aims of the previous plans through maximising the private sector's co-operation in the provision of jobs, through continuing the diversification of the economy to decrease its dependence on oil revenue, through providing new physical infrastructure for the expanding population, through improving social services, through efforts to raise per capita income, and through attempting to maintain a balanced budget over the five year period. The sixth plan gives priority to expanding the fields of technological development and environmental protection, and to promoting regional and international initiatives.

Objectives

The development of the agriculture sector during the period of the sixth - current - plan (1995-200) will be guided by the following objectives:

- To contribute to the security of the country's food supply through the diversified production of cereal, vegetable, animal, and fish products that are appropriate to the Kingdom's available natural resources, and achieve the optimum long-term use of water.
- To increase and diversify agricultural production through the application of large-scale production technology that utilises renewable water sources and modern irrigation methods most efficiently.
- To achieve satisfactory growth in the yields of major crops and animal and fish products, so as to minimise costs and reduce water consumption per unit of output, particularly those products where the Kingdom possesses promising resources and a comparative advantage (such as fish production).
- To make a significant contribution to the creation of job opportunities for rural dwellers, and to improve their welfare.
- To attain satisfactory growth in labour productivity and realise high Saudi-isation rates in agriculture.
- To raise efficiency in the agricultural sector in general . p. (215)

Policies

The following major policies will be implemented in the agriculture sector in connection with the above objectives of the sixth plan (1995-2000):

- Investment will be encouraged in large agricultural projects that depend on renewable water resources, use modern irrigation systems, and consume low quantities of water.
- Land will be distributed in areas with large quantities of renewable water resources, areas with critical ground water depletion will be identified, and regulations will be introduced on appropriate water pumping rates.
- The provision of selected agricultural inputs and other support services to farmers will be continued, including agricultural extension services and the distribution of improved seeds and seedlings.

- Marketing channels for small farmers will be improved through the provision of storage facilities for perishable vegetables, while methods to promote private marketing channels will be studied.
- Training will be provided to upgrade the skills of Saudi manpower in different specialisations.
- Within a framework of comparative advantage, international competitiveness, and the optimal utilisation of resources, diversification of the agricultural production base will be encouraged, through increased local production of vegetables and fruits in greenhouses and the expansion of the fishing industry using advanced technology.
- Research on problems specific to the Kingdom's agriculture will continue to be supported (particularly advanced technology fisheries), with a view to increasing efficiency in resource utilisation and enhancing co-ordination between national, regional, and international scientific institutions on the one hand and the executive agencies concerned on the other.
- The collection and dissemination of data and information concerning agricultural resources, prices, production, and the costs of agricultural commodities will continue, and the basic data and information base will be developed.
- The private sector will be encouraged to establish animal feed factories which use imported raw materials, so as to attain a prudent level of meat production at a relatively competitive cost and with the optimal utilisation of local raw materials.
- Joint studies with other GCC states will be conducted to promote co-operation in the production, storage, and marketing of the main food items, including fish products, and feasible related projects will be implemented.
- The flora, fauna, and fish resources of the Kingdom will continue to be protected and developed in order to maintain the proper ecological balance. P (216-217)

5.3 Water Strategy, Objectives, and Policies

This section will address an issue that is directly related to agricultural development policies in Saudi Arabia, namely water strategy, objectives, and policies as documented in the Fourth, Fifth, and Sixth Development Plans (1985-2000).

5.3.1 The Fourth Development Plan (1985-1990)

For a general overview of the Fourth Development Plan, see Sections 4.2.1.3 and 5.2.2.

The Fourth Development Plan strategy laid special emphasis on the rational utilisation of scarce water resources. As future water supply would come largely from finite non-renewable reserves, the main focus of policy during the period of the fourth plan was on the introduction of conservation measures, strict regional water management, the establishment of priorities in water use, the introduction of tariff systems, and closer co-ordination of agricultural and water development plans. Such policy measures were to be in accordance with the National Water Plan.

Objectives

The development of the water sector during the fourth plan was to be guided by the following objectives:

- To meet the present and future water needs of society.
- To limit the development of all water resources to prudent levels and to effect their conservation in accordance with the long-term needs of the Kingdom.
- To enhance the utilisation of existing water resources through the construction of dams for recharging aquifers, and through improved methods of collection, treatment, and utilisation of sewage water.

Policies

To achieve these objectives the following policies were put forward:

- The co-ordination of the development and utilisation of all water resources under the guidance of the National Water Plan.
- The maintenance of a reliable database on water resources and demand - including aquifer characteristics, groundwater storage, water quality, change in

water levels, rainfall, infiltration, and evaporation - based on hydro-geological studies.

- The continued implementation of projects which supply water from local sources, such as desalinated seawater, where the local groundwater supply is insufficient in quantity or quality, while giving the highest priority to the water requirements of the population.
- The establishment of administrative units for the enforcement of laws, regulations, and water rights in accordance with established priorities for water use.
- Monitoring the consumption of all water users and the quality of water used, through the installation of water meters and the preparation of a progressive tariff system in all sectors of water use.
- Restriction of pumping rates in areas experiencing serious depletion of groundwater resources and deterioration in water quality to levels which will sustain future water supplies, and the definition of short-, medium-, and long-term pumping rates for all aquifers or parts of aquifers.
- The introduction of water-saving techniques through the establishment of national specifications and standards for water quality, treatment and usage of sewage water, irrigation equipment, water supply and distribution works, plumbing in houses, factories, and other buildings (MOP, 1985).

5.3.2 The Fifth Development Plan (1990-1995)

For a general overview of the Fifth Development Plan, see Sections 4.2.1.4 and 5.2.3.

Objectives

The development of the water sector would be guided by the following longer-term objectives in the fifth plan (1990-1995):

- To provide sufficient quantities of good quality water in keeping with recognised international health standards to meet the needs of urban and rural communities.
- To secure sufficient water supplies to meet the demand of industrial development activities.

- To satisfy the water requirements of modern agricultural operations that aim to attain a prudent degree of basic food self-sufficiency.
- To endeavour to reduce water consumption by agriculture without affecting its targeted growth rates.
- To conserve and develop currently proven water resources efficiently, and to seek new water resources.
- To generate sufficient revenues to cover operating costs for water production and distribution . p. (69).

Policies and Main Programmes

To achieve these objectives the following principle policies were put forward to be applied during the period of the fifth plan and beyond:

- A phased conservation programme would be established through the implementation of a water fee structure and revenue collection system that would eventually generate enough money to cover all operating costs of producing and delivering water to the various user categories.
- Regulations covering the conservation of water would be fully enforced, and water consumption for agricultural purposes regularly monitored.
- Subsidies towards the cost of well drilling and pump purchases were to be re-evaluated. Subsidies for irrigation equipment and water saving technology applications (e.g. increased use of greenhouses for the production of vegetables) would be retained.
- Hydro-geological studies of principal and secondary deep aquifers would be resumed in order to increase knowledge of the proven non-renewable water resources in the Kingdom. These studies were to include the drilling of exploration and observation wells, pumping tests, water quality determination, and monitoring the aquifers under exploitation by means of field observations and groundwater model simulations. Likewise, water management studies of renewable water resources utilisation, and feasibility studies for proposed desalination and waste water reclamation projects would continue. These study programmes would serve to establish a sound database for completing the National Water Plan.
- The National Water Plan was to be completed, along with the National Water Code and related legal documents for enforcement. The primary aims of the National Water Plan were to maintain a strategic reserve of non-renewable water resources by emphasising secure water supplies to the Kingdom's population, its industrial enterprises, and water-efficient agricultural undertakings. Adverse effects on the environment were to be minimised . p. (172)

5.3.3 The Sixth Development Plan (1995-2000)

For a general overview of the Sixth Development Plan (1995-2000) , see Sections 4.2.1.5 and 5.2.4.

The overall development of the water sector will be implemented in the period of the sixth plan through the objectives, policies, and programmes indicated below.

Objectives

These will include the following:

- To provide sufficient quantities of good quality water to meet the needs of the population, the producing sectors, and other public services in a more efficient manner.
- To conserve water resources - particularly non-renewable groundwater - and to develop these resources to meet current and future demand.
- To improve the management, operation, and maintenance of operating water facilities, such as desalination plants, and to reduce their costs as much as possible.
- To increase the efficiency and utilisation of non-conventional water resources, such as desalinated water, treated waste water, and agricultural drainage water, so as to maintain the natural water resources in the Kingdom.
- To raise the labour productivity in the water sector and to train Saudi manpower to adapt to the continuous development in water technologies . p. (190-191).

Policies

The following policies will be adopted in order to achieve these objectives:

- Water should be considered as the most basic and valuable resource, and as an important factor in measuring the economic efficiency of public and private sector projects.
- The water studies programme will be resumed to update the hydrological information on aquifers and the water potential studies for some areas.
- The National Water Plan will be issued as soon as possible, based on the review and updating of previous studies on available water resources, and sectoral demand patterns will be determined so that appropriate water policies can be formulated.
- Rules will be established for the operation and maintenance of existing water resources in order to preserve their productive efficiency.
- The implementation of water supply projects will be continued, while giving priority to the population's need for drinkable water.
- Expanded use will be made of reclaimed waste water for agricultural and recreational purposes, and on an economic basis they will continue to be issued in order to promote the conservation of water resources.

- A revenue collection programme will be developed according to a system of water consumption tariffs for various consumer categories to provide financial resources that are sufficient to cover the operating expenses of water production and distribution . p. (191).

5.4 The Progress of Agricultural Change in Saudi Arabia

In 1963 approximately 475,000, or 72 %, of the economically active nationals in Saudi Arabia were designated 'agricultural workers and Bedouin'. By 1975 this percentage had dropped to 57 % (agriculture and fishing), and by 1986 the proportion working in agriculture had fallen further to 11 % of the total labour force. To a large extent this was due to the country's reliance on expatriate foreign workers to meet the expanding needs of the modern economy in general and in the field of agriculture in particular. However, though it remains true that Saudis, especially the young, have increasingly abandoned agricultural activity, migration to urban areas has been checked, thanks in large measure to government initiatives which have resulted in the locating of government employment in rural areas, and an improvement in services and living conditions in such areas, though these, as we shall see, have some adverse effects on the environment.

The construction boom of the 1970s (see Chapter 3) led to the importation of a large number of foreign workers, and this in turn led to a shortage of food. Saudi Arabia was forced to rely heavily on the importing of food from outside the Kingdom, up to 80 % of its food coming from abroad. In 1971, for instance, food accounted for 31.6 % of total imports costing, SR 3,197 million. The government acted to remedy this shortfall in national food production, and there were made substantial inducements to farmers to improve their agricultural methods and to nomadic Bedouin to practise settled farming on a much greater scale than hitherto. An increase in investment in modern agricultural projects took place, especially in dairy and poultry farms, which grew in number considerably. The Third National Development Plan (1980-1985) provided substantial incentives to reach 'self-sufficiency' in respect of some foods regarded as of strategic importance for national security (such as wheat). The result was that by 1987 food imports had reduced to 17.1 % of import spending, though actual money spent had risen to SR 12.9 billion (in 1987 $1.00 = SR 3.75).

In the last ten years agriculture has seen the benefit of increased income from oil in the form of expanding markets, transportation cost reductions, and an increased supply of modern techniques and approaches, including the greater use of fertilisers, improved seed quality, more up-to-date machinery, and more readily accessible credit sources. In fact, it may rightly be said that the growth in the agriculture sector in the last decade is one of the most outstanding success stories of Saudi Arabia. Saudi Arabia has become in this time a major wheat exporter, and has almost achieved self-sufficiency in vegetables, eggs, poultry, and dairy produce. In just the last five years agriculture's annual output has tripled in value to more that $6 billion. Wheat production has risen ten-fold in the last ten years to almost 1.3 billion tons.

1.1 million hectares of agricultural land were distributed through the arable land distribution scheme during the years 1980-1990, with an increased rate in distribution in the later years of this period. Between 1981 and 1984, during the period of the third plan, around 154,000 hectares went to ten large agricultural stock companies, and some 106,000 hectares went to individual farmers (MOP, 1985).

During the first three years of the fifth plan (1990-1995) there were about 396,000 hectares distributed in high-potential water resources. Most of the total land allocated during the period of the fifth plan (around 807,000 hectares) was allocated, however, in areas depending on non-renewable water resources (MOP, 1995).

Today Saudi Arabia's agricultural production is increasing. Agriculture has benefited from higher oil revenues in the form of government support in input and output. This development in the agricultural sector reflects a swift rise in GDP, which was dominated by the increase in oil income (see Chapter 3).

5.5 Assessment Of Agriculture And Water Policies

The first impression is that Saudi Arabia's agricultural development policies have produced impressive results. There has been a shift in agricultural production from what was barely subsistence level to a situation where there is a surplus of wheat and other major crops. This has been a considerable achievement by agricultural policy

makers, who have had to work against odds to attain such development. Saudi Arabia is short in some of the fundamental requirements for a successful agriculture: water, manpower, and regional stability, as might be expected of the Arabian peninsula. To reach the point which it has attained in agriculture the Saudi government has had to spend vast amounts of its oil income on price support grants, input subsidies, and interest-free credit. There is now in the Kingdom a strong agricultural sector playing a full part in the GDP.

A relevant question, however, arises in connection with our study. It is the question whether the agriculture development policies have helped to protect the major ecological features in general and oases in particular. To answer this question, the discussion which follows will focus on agricultural and water policies and their impact on the general environmental features and on oases in particular.

It is easy to conclude from the agriculture objectives and policies outlined in this chapter from the National Development Plan that the basic point of such strategies has been the intensification of agricultural production, especially in such crops as wheat and barley. Such intensification requires that expansion and improvement should be made in all respects affecting production - finance, manpower, and natural resources - to reach the desired goal of self-sufficiency in production. The government has installed desalination units, irrigation networks, and roads linking production areas to market centres; it has prepared land and soil surveys. All this has encouraged a massive increase in production. Wheat production in 1985, for instance, reached approximately 2.4 million tons, some 800,000 above estimates, and in 1992 it reached around 4.2 million tons (Looney, 1990).

Agriculture makes great demands on water resources, accounting for around 85% of demand, some 18,100 million cubic metres a year. This compares with domestic consumers who account for only 5 %, and industry, which uses even less (Table 5.1). Nor is the use of water entirely efficient. Shallow wells, which have provided water for pivot irrigation, are drying out, forcing agriculturalists to dig deeper. Water quality is often so poor that corrosion halves the working life of irrigation equipment. Fossil water drawn from deeper reservoirs must be purified and cooled before it can be used for irrigation. All this plays a part in the constant increase in the cost of

supplying suitable quantities of water. Some types of modern applications, such as drip irrigation and the use of sprinklers, may be more economical than traditional methods, but the savings they offer are minimal when set against the great increase in the land area under cultivation.

	1979/80	1984/85	1999/2000
Resources			
Non-renewable	3450	3450	3450
Renewable	1145	1145	1145
Desalination	63	605	1198
Reclaimed effluent		140	730
Total	4658	5340	6523
Utilisation			
Urban/industrial	502	823	2279
Agriculture (irrigated)	1832	1873	3220
Rural/livestock	27	28	38
Total	2361	2724	5537
Surplus	2247	2616	986

Table 5.1 Water resources and utilisation (million cubic metres per year).
Source: Beaumont and McLachlan (eds.) (1985). P.221

The consequences of the Saudi agricultural strategies have been seen in the setting up of many agricultural development companies in the private sector. Large irrigation projects, with areas of more than 2,000 hectares each, have been established in various areas of Saudi Arabia, such as Tabak, Hail, Wadi Addwasir, and Haradh, as shown in Table 5.2. Figures produced by the Ministry of Agriculture and Water (MAW) indicate that the cultivated areas reached 2.3 million hectares during 1984 (Abderrahman and Ukayli, 1987).

Agricultural company	Capital investment million SR	Cultivated areas hectares 1984-1985	Location
NADEC	400	4660	Haradh
		10042	Hail
		17061	Wadi Addwasir
HADCO	500	15000	Hail
TADCO	200	10375	Tabuk
Qaseem	500		Qaseem
Asharqiyah	400	6000	Eastern Province
ENMA	100	8000	Wadi Addwasir

Table 5.2. Capital investment, cultivated areas and number of centre-pivot irrigation systems for some agricultural development companies in Saudi Arabia (1984-1985).
Source: Abderrahman and Ukayli (1987). P. 382

Groundwater is the main source of irrigation water, and thousands of wells were sunk to satisfy irrigation water demands by pumping. Sprinkler irrigation techniques, using the centre-pivot system, are in widespread use in most large farms cultivating forage crops and field crops (wheat and barley). There have been some difficulties in some irrigation projects. Problems experienced include losses in the quantity and quality of wheat production, the high costs of operation and maintenance, and great variations in draw-downs in the dynamic water levels in many wells. In a dry country such as Saudi Arabia these difficulties could lead to a serious shortage in groundwater resources. Table 5.2 shows that just six large companies have invested 2.1 billion SR in cultivating around 71,000 hectares in different locations. Most irrigation projects in the country rely on groundwater as their only water source. Some projects have as many as 167 drilled wells tapping different aquifer systems (Table 5.3).

The depth of these wells varies from 1 km to 1.5 km. The exact distance between adjacent wells is dictated more by the area irrigated by each centre-pivot than by the availability of groundwater. With an average production rate range per well of between 50 and 126 litres per second, peak demand periods find wells operating for up to 72 hours continuously to satisfy water requirements. Some irrigation projects do not use an exact pre-determined operation schedule, since pumping policies are out of their hands, being functions of multi-regional hydrogeological considerations. (MAW, 1984; Abderrahman and Ukayli, 1987).

Agricultural company	Location	Number of drilled wells	Number of centre-pivot systems
NADEC	Harad	45	90
	Hail	99	198
	Wadi Addwasir	167	314
HADCO	Hail	150	300
TADCO	Tabuk	110	200
Assharqiyah	Eastern Province	58	116
ENMA	Wadi Addwasir	90	90

Table 5.3 Number of drilled wells and centre-pivot systems for some agricultural companies in Saudi Arabia.
Source: Abderrahman and Ukayli (1987). 382

Saudi Arabia has an arid climate with very little rainfall, such that the possibility of a renewable surface water supply can be discounted for practical purposes. With the rapid expansion in farm holdings, large scale agricultural projects have had to rely on water supplies from non-renewable underground aquifers, which have supplied up to 80 % of the water requirements. The last decade has seen a great increase in the demand for such supply sources. In the year 1987 agriculture consumed 14 billion cubic metres of water, about 90% of the overall consumption in the country. Water consumption by wheat was around 5.3 billion cubic metres, which was 37% of the total water use by the agricultural sector. Such a usage rate is very high in relation to Saudi Arabia's long-term potential non-renewable groundwater resources (MOP, 1990).

Most of the identifiable water sources in Saudi Arabia involve surface run-off and the pumping of water from shallow recharged aquifers and springs. The volume of this resource is assessed at around 1,145 billion cubic metres per year, which is about 25% of the total resources. The resource is concentrated for the most part in the south east area of the country, where it is used to back up other resources so as to satisfy the growing urban, industrial, and agricultural demands. There is still a large quantity of non-renewable water in deep aquifers in the Eastern and Central Regions of the Kingdom, where it makes up more than half of the requirements of the regions as planned by the MAW. However, this resource, which by its very nature cannot be replenished, is diminishing swiftly in many places because of the high withdrawal rates.

In addition, over-pumping of groundwater in coastal areas has led to salt-water contamination difficulties. In some parts of those areas water levels are already low because of increased consumption and the fact that there are no available economical alternatives. The intrusion of salt water and the expansion of the fresh water/salt water interface area has compounded the problems.

In some places groundwater may cause land subsidence. This has happened in Japan, especially near river or seaside locations, and has led to the use of artificial recharge wells.

Oasis agriculture, such as that found at Al-Hasa in the Eastern Province, is undergoing depletion of its non-renewable resources. It has been reported that the total maximum rate of groundwater production without disturbing the artesian flow from springs in the Al-Hasa region is about 10.125 cubic metres per second. If the rate of pumping increases by 20% the springs will cease to supply water within 15 years. Furthermore, the total water demand for all purposes is expected by the year 2000 to be twice the present demand. The greatest volume of groundwater used in the Al-Hasa region, about 90%, is consumed in the irrigation of an area of some 8,000 hectares. The agricultural, social, and educational developments of the last decade have led to such a demand for water for all purposes that it has exceeded the supply from balanced groundwater production in the area. The extent of the Al-Hasa water problem can be seen even more starkly when it is remembered that between 75% and 80% of the spring water originates as fossil water in the neogene aquifer. 10-15% is

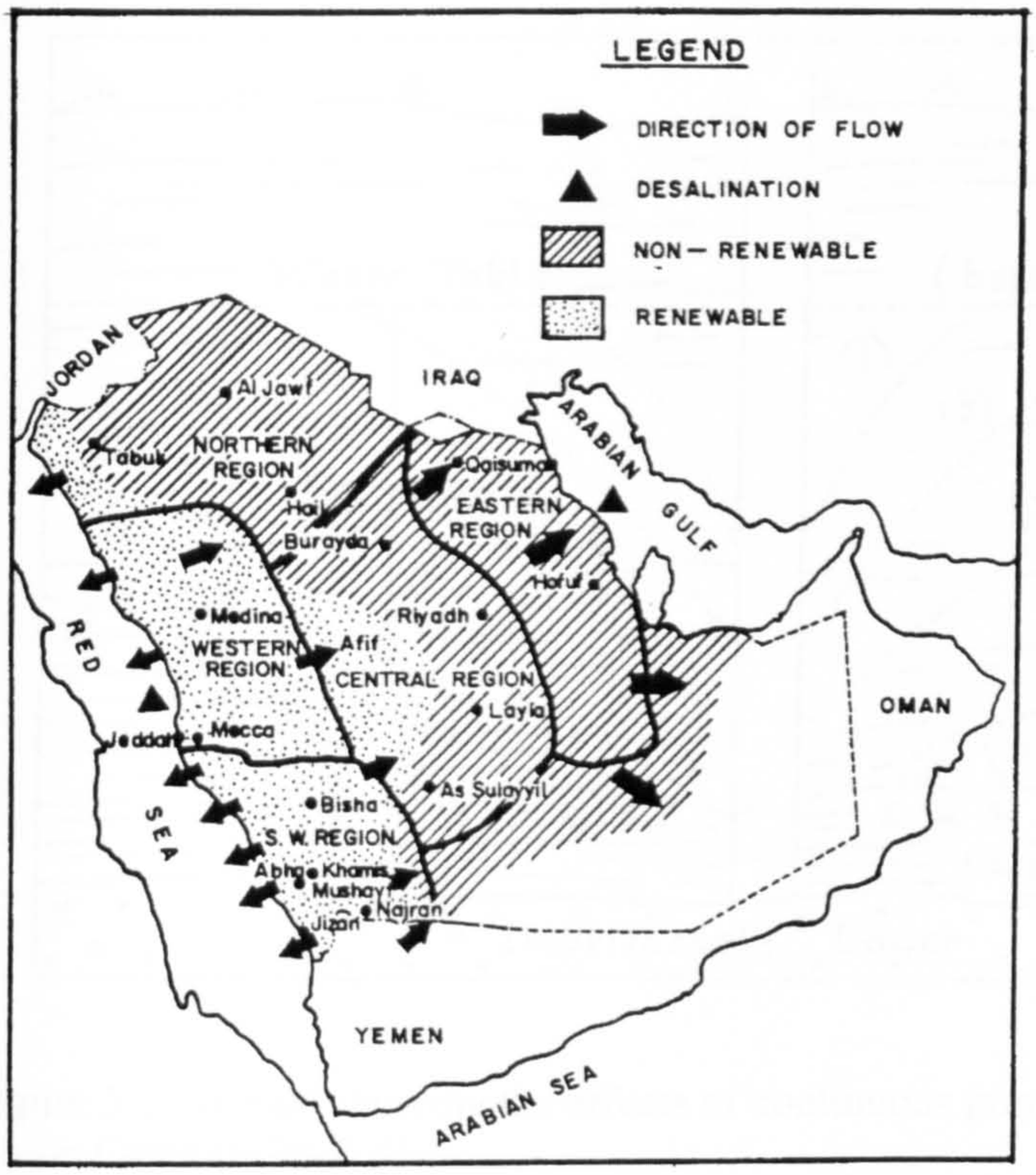


Figure 5.1. Exploitable water resources on a regional basis.
Source: Ukayli and Husain (1983). P. 11

supplied to the neogene from Khobar and Umm-er-Radhuma aquifers through by-pass links between the three aquifers in the truncation area on top of the Ghawa anticline. (Abderrahman and Ukayli, 1984).

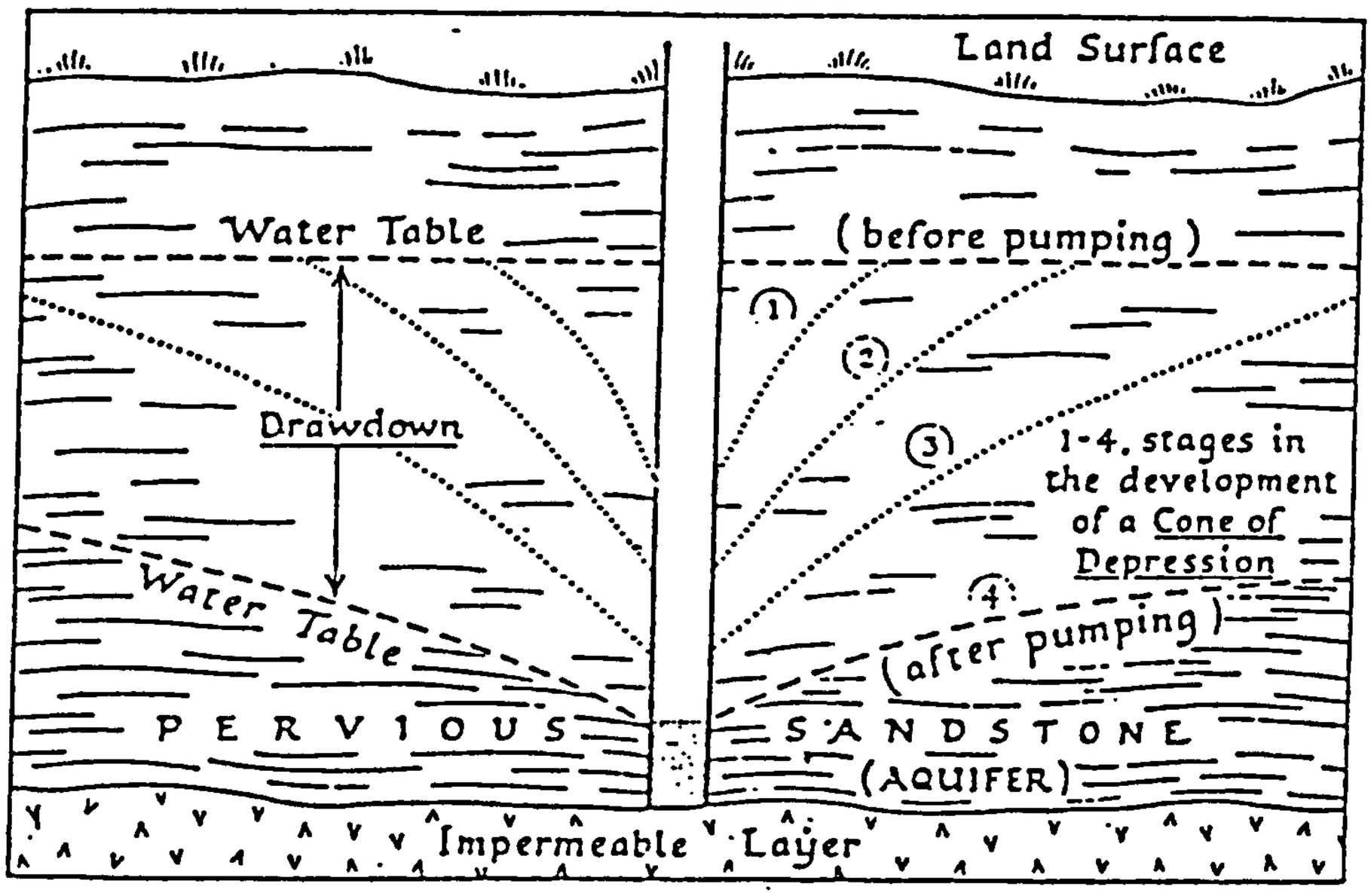
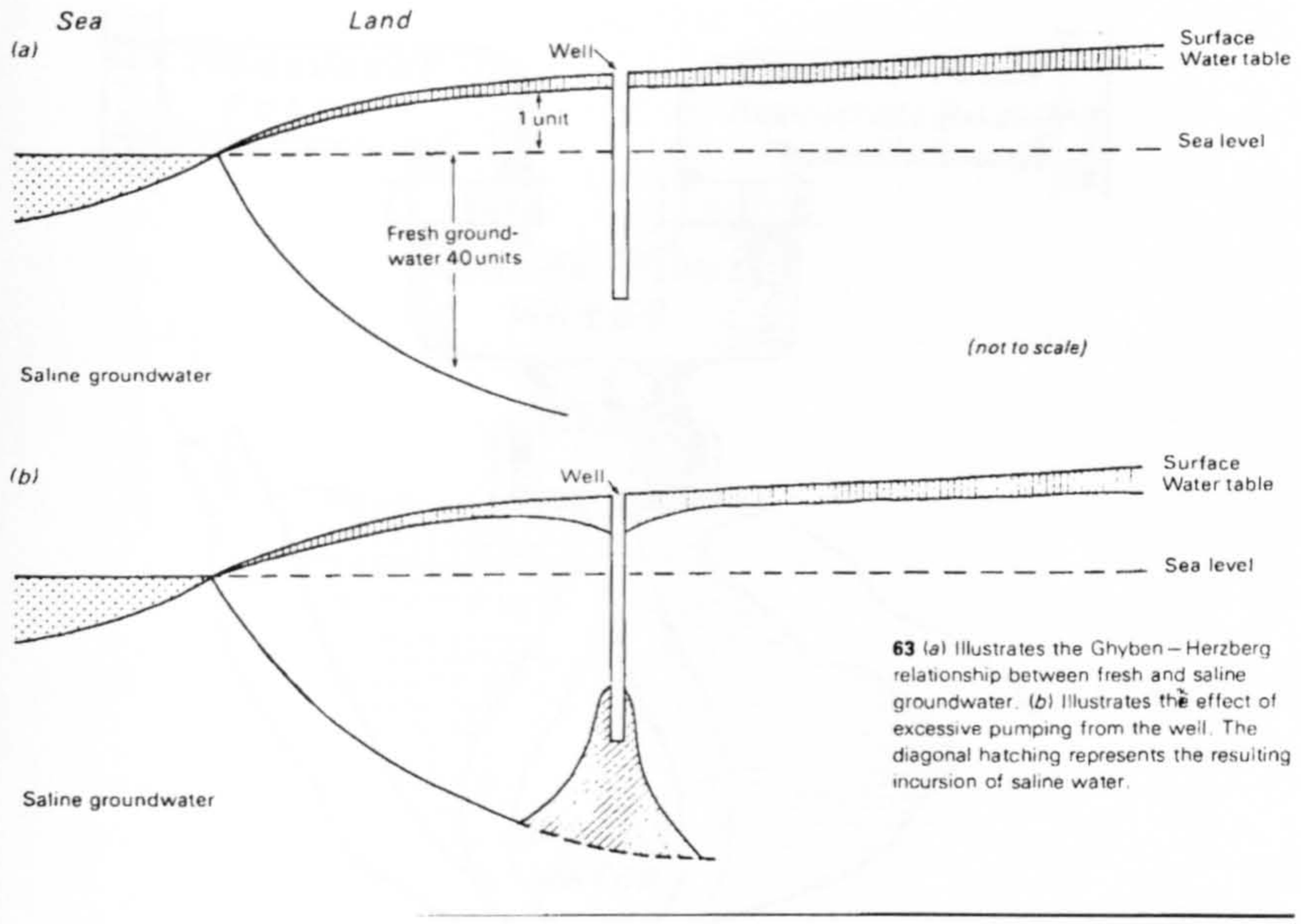


Figure 5.2. A well showing the effects of continuous pumping.
Source: Cantor (1970). P. 41

Abderrahman and Ukayli (1984) argue that the total dissolved solids (TDS) in the spring water ranges from 1,372 and 1,534 parts per million (PPM), with an average of 1,464 PPM. The main dissolved ions are sodium, chloride, and sulphate. The water is put into salinity classification 4 and sodium class 3, according to the US classification of irrigation water. What this means is that there is a potential high salinity hazard when this water is put to irrigation use. The fact is, however, that this water is successfully being used for irrigation in the Al-Hasa region, because the crops in the area have a high salinity toleration. The organic matter content and the trace elements in the water are lower than the permitted standards of the World Health Organisation (WHO) for drinking water. If there is increasing water demand for domestic purposes, for waste water treatment, for industrial uses, for energy production, for irrigation, or for whatever other purpose, then if the control of water is not managed properly and if demand outstrips available supplies, water can no longer be thought of as a renewable resource. It is therefore of paramount importance that planning policies, agricultural policies, and water and environmental policies should be integrated in order to manage the existing limited natural resources of water.



63 (*a*) Illustrates the Ghyben–Herzberg relationship between fresh and saline groundwater. (*b*) Illustrates the effect of excessive pumping from the well. The diagonal hatching represents the resulting incursion of saline water.

Figure 5.3. The effect of excessive pumping from a well.
Source: Goudie and Wilkinson (1977). P. 69

The effects on natural resources are severe. As has been stated already, there is some evidence of falling water levels in aquifers. Water levels continue to fall despite the clearly articulated government policy which implies official efforts to limit the development of all water resources to prudent levels and to effect their conservation in accordance with the long-term needs of the Kingdom (MOP, 1990).

To date there has appeared no comprehensive study to assess the extent of the depletion. But investigations, such as that undertaken by R.G. Thomas for the UN Food and Agriculture Organisation (FAO) has concluded that the Saudi agriculture boom has exploited groundwater at a faster rate than it can be recharged. This means that groundwater wells must be drilled deeper and deeper, and the day may come when the cost of extracting the water will be too great, even for the Saudis (Madeley, 1985).

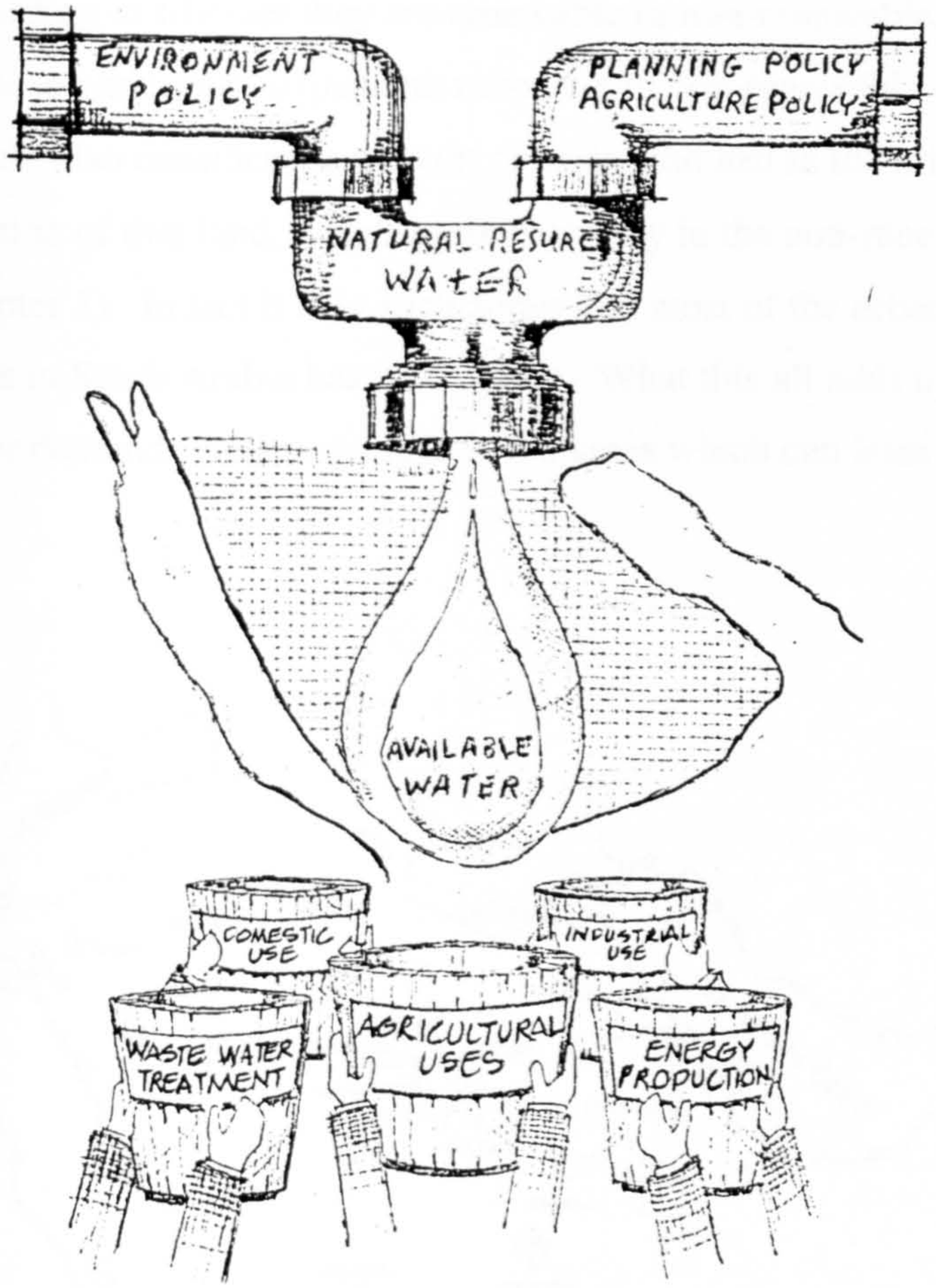


Figure 5.4. Managing a limited natural resource (water).
Source: Developed by the researcher, from Marshall (1983). P. 89

The National Development Plans have stated that one of the major objectives is to meet the present and future water needs of the country, to conserve water resources (especially non-renewable groundwater resources), and to develop these resources to respond to current and future demand. Furthermore, agriculture and water policies discourage the excessive utilisation of areas with potentially serious problems, such as non-renewable groundwater resources. Good soil and renewable water conditions are found in a limited strip of Saudi Arabia along the western escarpment and in some other wadi channels where rainwater can be utilised. Large-scale urban development, however, has tended to take place in areas which are dominated by non-renewable water, such as the Eastern and Central Provinces .

We may compare Figure 5.5, which shows the zones for agricultural expansion in Saudi Arabia, with Figure 5.1, which indicates the water resources in the country

according to whether they are renewable or non-renewable. It may be noted that most of these agriculture expansion zones are in non-renewable water source areas. We should also consider the amount of oasis land lost in the urbanisation process and the location of that land, which again is largely in the non-renewable water areas (see Chapter 3). In fact it is in such zones that most of the urban development in recent years in Saudi Arabia has taken place. What this all adds up to is that the greatest water demands are being made in the areas which can least meet them.

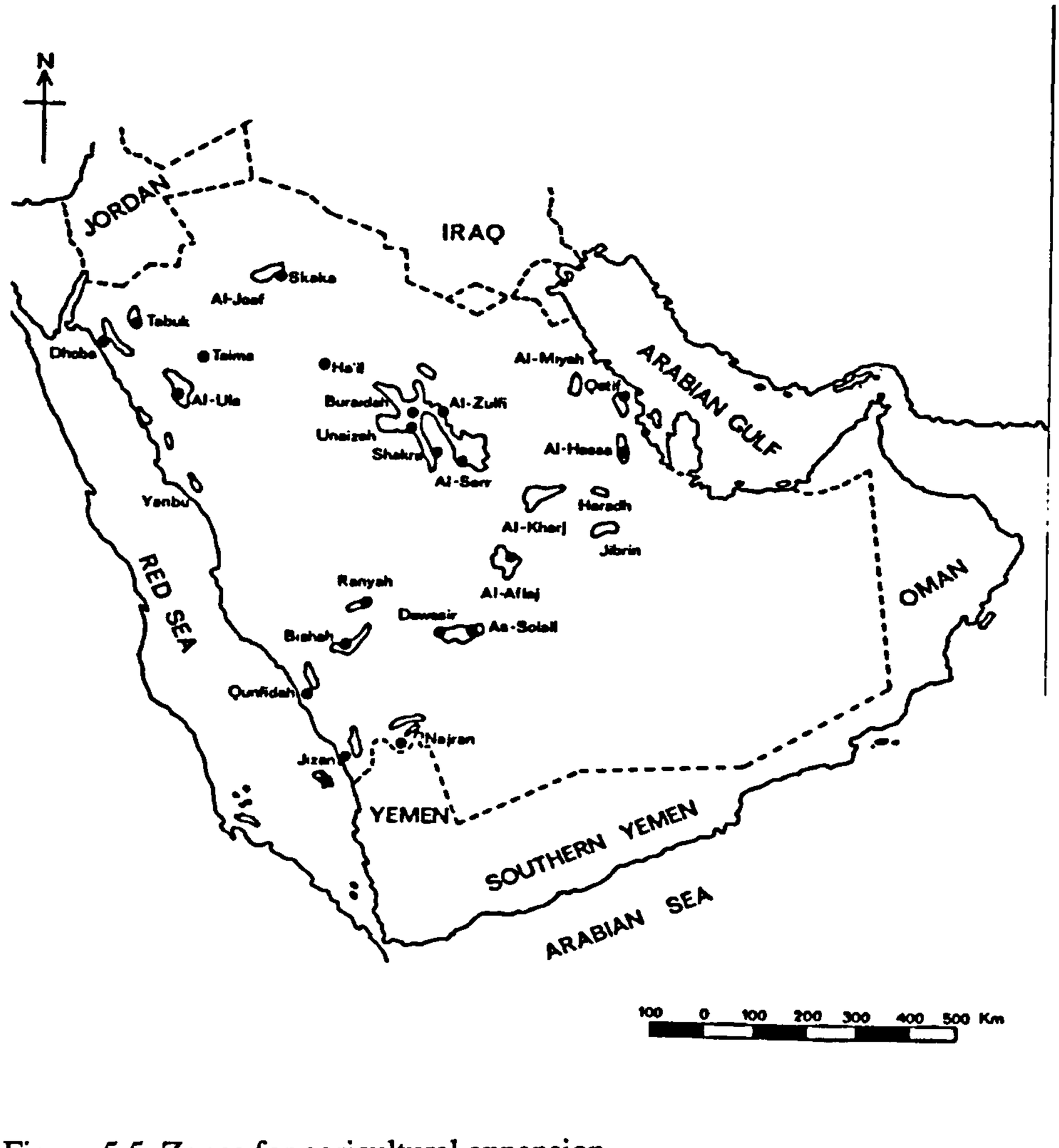


Figure 5.5 Zones for agricultural expansion.
Source: Hajrah (1982).p.14

A Saudi survey (1984) has supported this view. It states:

> In some regions, notably in the east and centre of the country, the water table has fallen significantly. An irrigation expert in Riyadh describes some areas around the capital as "in real

> danger" unless exploitation of resources is more closely controlled. (Middle East Magazine, 1984, p. 53)

A further point to consider is that most of the 807,000 hectares distributed during the period of the Fifth Development Plan (see above in this chapter) is in areas that depend on non-renewable water, something which is contrary to the stated policy that agricultural land should only be distributed in areas with high potential renewable water resources.

Moreover, the national strategy is supposed to apply to both large-scale and small-scale farmers, but in practice it is the larger concerns which are favoured by the government to the detriment of small farmers. Madeley (1985) argues that Saudi agricultural policy 'tends to ignore the smallholders on their unirrigated plots - the farmers to whom the nation might have to turn as oil revenues decline' (p. 63).

An example of what might be achieved by a large concern with government support is the case of the Hail Agricultural Development Company (HADCO). HADCO produced a record 102,000 tons harvest in 1984. Like many large companies, it operates a sophisticated irrigation system, and uses large quantities of top grade fertiliser on well-prepared land. Smaller farms cannot achieve such levels of production, and they face problems which may be obscured by the high-profile success of large organisations like HADCO. Many large enterprises use flood irrigation, which may lose up to 40% through evaporation in hot weather, but which can be swallowed up in their general budget, while the smallest farmers often have to be content with using more modest technologies that give a better yield than the old subsistence farming to which they were previously accustomed. Those who aim to produce on a larger scale for the market, but who do not capitalise their farms adequately, may suffer. As one commentator has remarked:

> With industry experts in the Kingdom assessing break-even point for wheat production at some three tonnes, and the national average at 2.2 tonnes, smaller farmers producing for the market may clearly be in some difficulties. (Middle East Magazine, 1984, p. 53)

Clearly the policies favour large-scale agricultural operations.

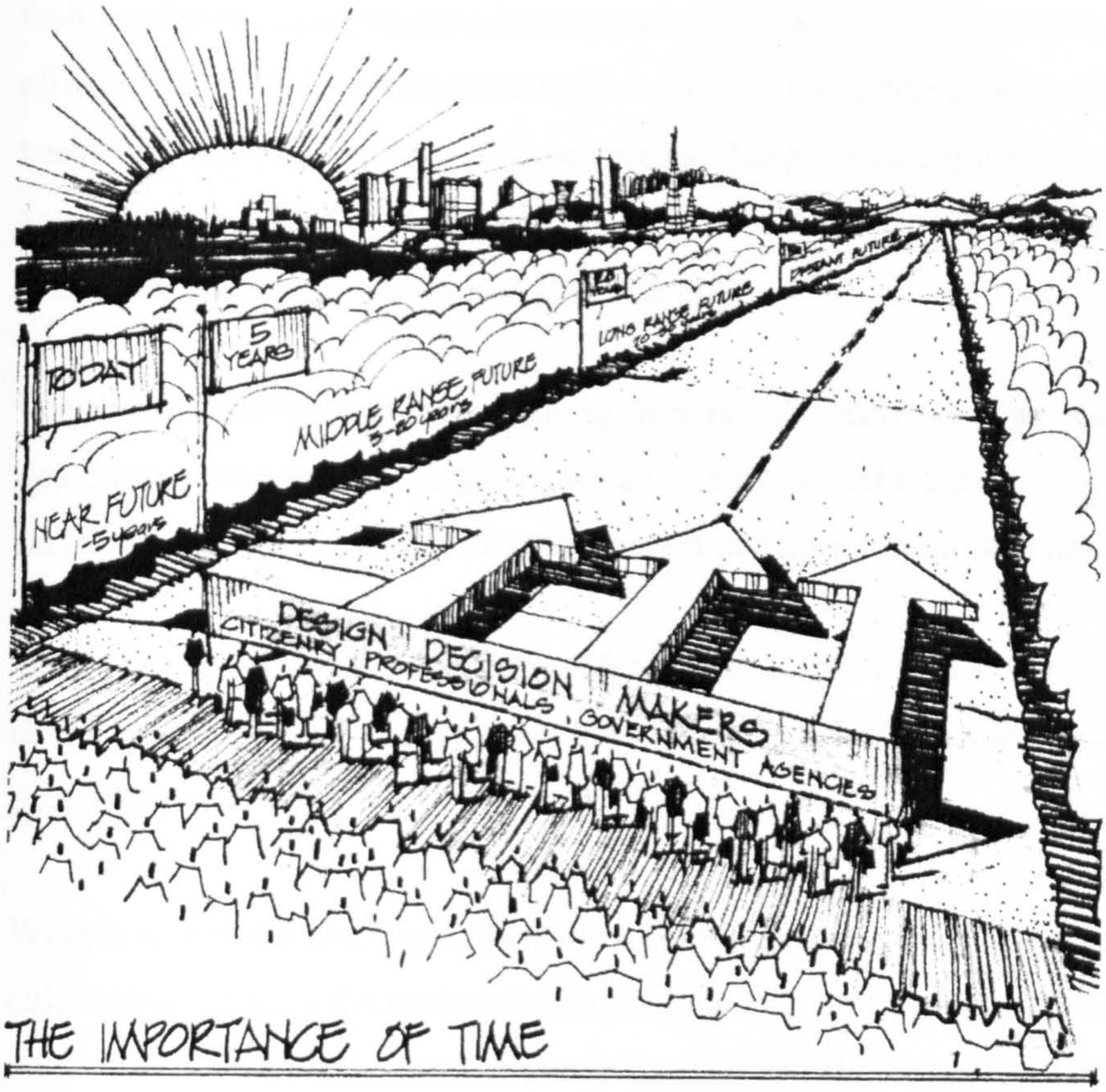


Figure 5.6. The effect of today's decisions on tomorrow.
Source: Marshall (1983). P.60

Marshall (1983) emphasises the importance for decision makers of thinking their intentions through before making policy decisions, because decisions made today will have a crucial impact in the future (see Figure 5.6). By following this cautious path we will be more likely to make wise decisions today about the natural environment and the built environment of tomorrow.

It is clear from the foregoing discussion of agriculture, water, and other policies and objectives that some of the steps taken to deal with perceived problems or to meet perceived needs have led to negative results that were not anticipated. In fact there has been a certain loss of agricultural land, despite the government's commitment to the expansion of the agricultural sector and self-sufficiency in this respect, and despite the considerable achievements that have been made in this area. What has in fact happened is that the rapid changes initiated by the government's policies have altered the relationship between man and the environment. Subsidies and the use of high-

tech machinery have placed a burden on natural resources like water, and have in effect made them less accessible to those who still practise at least some of the traditional farming methods and techniques. Large-scale capital intensive enterprises are accommodated, if only in the short term (for they too need land and water resources, and cannot function if they run out).

The environmental problems resulting from development, such as soil erosion, depletion of non-renewable groundwater resources, and the extinction of flora and fauna, are affecting the general environment and agricultural development itself.

In this connection Mannion (1995) refers to three reasons for deforestation in developing countries, and these are the spread of agriculture, logging, and mineral extraction.

What is more, soil erosion is also due to agriculture, and along with overgrazing and cultivation is one of the factors leading to desertification, which can be defined thus:

> The long term degradation of drylands, resulting from either over-use by man and his animals, or from natural causes such as climatic fluctuations. It leads to loss of vegetation cover, loss of topsoil by wind or water erosion, or loss of useful plant production as a result of salinisation or excessive sedimentation associated with sand dunes, sand sheets or torrents. (Mannion, 1995, p. 287)

Urban growth took place without proper consultation and consideration of ecological concerns. The outcome, as mentioned in Chapter 3, has been the loss of ecologically sensitive areas, the loss of areas that are in greatest need of preservation for their unique ecological features, the loss of agricultural land in the oases, and various other problems (see in particular Section 3.8).

The development policies put forward in the Third and Fourth National Development Plans (see Chapter 3), which had the objective of slowing down the rate of rural to urban migration, and other policies which aimed to improve the social and physical infrastructure have in fact introduced a negative element as far as their impact on the environment in general and oases in particular is concerned.

However much the aim of such policies might have been achieved, the policies also resulted in the loss of green areas and the greater use of non-renewable natural resources, such as water. This is in direct contrast to policy announcements, which state, for example:

> The flora, fauna and fish resources of the Kingdom will continue to be protected and developed in order to maintain the ecological balance . . . land will be distributed in areas with large quantities of renewable water resources. (MOP, 1995, pp. 216-217)

Government environmental policies laid great emphasis on achieving sustainable development (see Chapter 3). The Fifth and Sixth Development Plans are quite explicit about their policies in this respect. These policies have the following aims:

- To protect the environment and its natural characteristics and ecosystems and to preserve natural resources.
- To achieve sustainable balance between population distribution and environmental capacities with due regard to the effects of population growth and consumption patterns on the natural resource bases.
- To achieve balanced sustainable growth while making optimal use and extending the life span of natural resources, particularly non-renewable resources.
- Rational development of land- and marine-based animal resources within their sustainable limits (MOP, 1990; MOP, 1995).

This indicates clearly that government decision makers have implemented plans for agricultural expansion without due regard to comprehensive integration with other development and environmental policies.

The government agricultural and water development objectives and policies as discussed in this section have had a negative impact on natural resources, such as soil and water. The groundwater level is dropping rapidly. Agriculture alone accounts, as we have seen, for 85% of water demand. Urbanisation and industrial development, as discussed at length in Chapter 3, have contributed to the negative impact on the environment in that many of the people have left the small farms to seek work elsewhere, and some of the former rural areas have been urbanised through the

introduction of infrastructures previously more characteristic of towns than of the country.

The researcher believes that national planning policies, agriculture policies, water policies, and environmental policies have all been formulated at national level, and that each of them is proceeding on its own track without comprehensive and effective-integration. As a result both cities and smaller local communities are experiencing environmental problems in general, such as air pollution, noise, as discussed in Chapter 2, and in particular there is a loss of oasis land in Saudi Arabia.

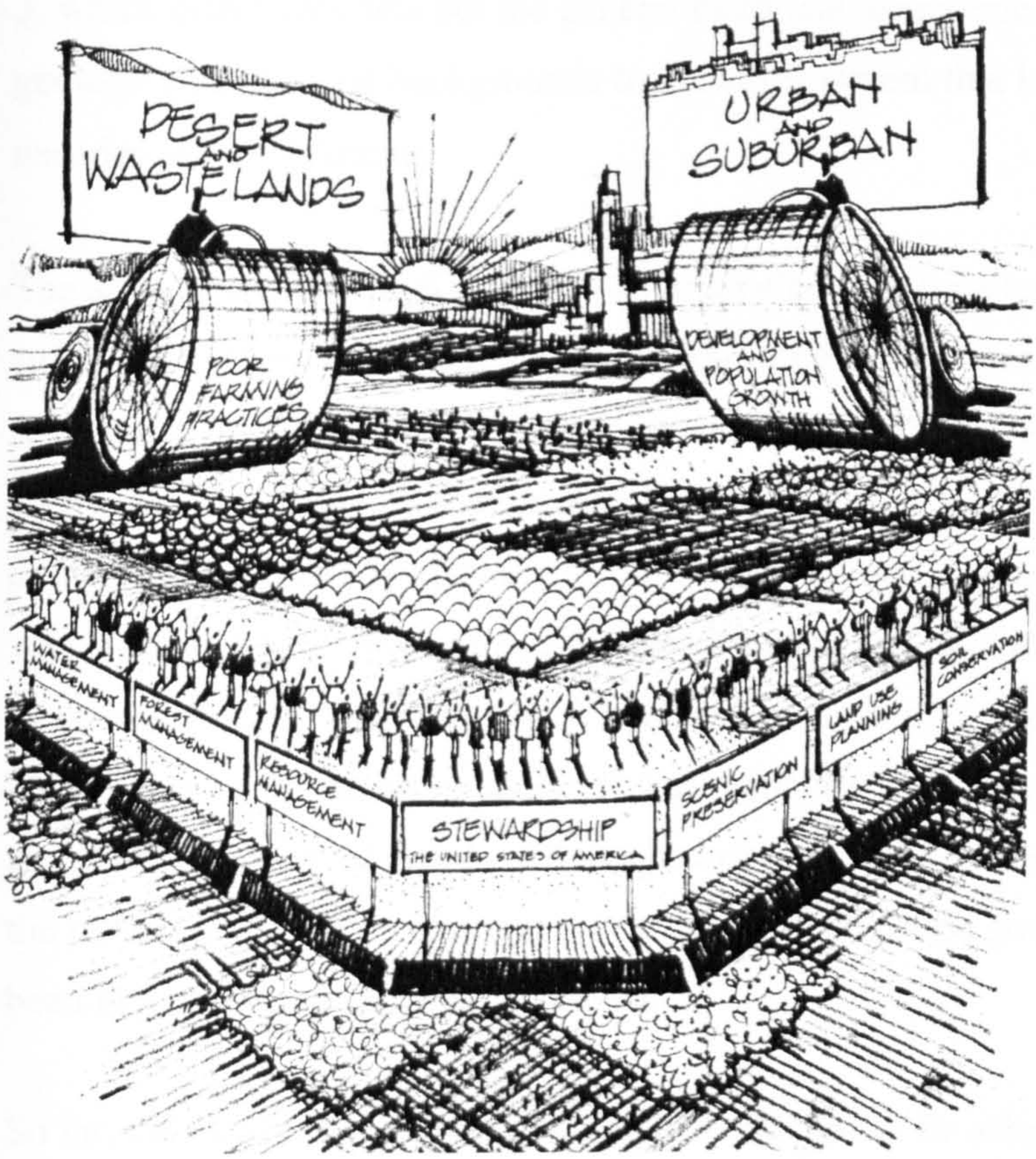


Figure 5.7. The forces affecting productive land.
Source: Marshall (1983).

The next part of this study will examine land development control policies to assess their consistency with other policies and their impact on the general environment and on the loss of agricultural land in Saudi Arabia.

5.6 Summary

This chapter has concentrated on agriculture and water objectives, policies, and development in Saudi Arabia, with particular reference to the stated objectives and policies of the five-year National Development Plans (covering the years 1970 to 2000) and the extent to which these objectives have been met and the development policies carried out. The chapter relates closely to the matters introduced in Chapter 3, which effectively sets out the general historical, economic, geographical, geological, and social backgrounds to the development that has taken place in recent decades in Saudi Arabia.

The acceptance that the Kingdom was in a vulnerable position through not being self-sufficient in food, combined with the recognition that its increasing wealth from oil revenues afforded the opportunity to provide massive input into the agricultural sector, led to a complete change over the thirty years covered by the National Plans. Saudi Arabia is already virtually self-sufficient in food. The objectives and policies which arose during the last three decades also had to deal with the consideration that there was already underway a shift from a rural to an urban society, itself not unconnected with the oil industry. It was recognised that a brake had to be applied to the rapid migration of people and manpower from rural to urban communities and to the related urbanisation of some previously basically rural areas. This slowdown has been to a considerable extent achieved.

So far, this is a picture of success, and indeed it has to be acknowledged that the rapid turn around in the Kingdom's agricultural fortunes has been one of the major success in Saudi Arabia.

Whatever the reasons, it is clear that agricultural interests have prevailed, and not the interests of the small farmers but rather those of the larger agricultural enterprises. Overuse of non-renewable water resources, partly because of agricultural concerns and partly because it is in areas with non-renewable water resources that most

urbanisation has taken place, has led to the situation where the supply of water for domestic, industrial, and agricultural purposes may be threatened within a few years.

Furthermore, the huge amount of water consumption has led directly to negative environmental consequences. Salinisation in areas near the sea and the increase in the area of fresh water/salt water interface has meant not just inconvenience for human water users. The ecological balance of some areas has been threatened, and there has been a basic change in the relationship of man to the natural environment. Priority has been given to supplying water to large agricultural enterprises, as well as to domestic and industrial users, with a corresponding shortfall of suitable irrigation provision for areas unable to wield enough influence, including oasis regions.

The next chapter will therefore discuss the policies and other factors which affect the development and use of land in Saudi Arabia, in order to explore the extent to which these policies and constraints integrate with each other and affect the nature of the environment.

Chapter 6

Land Development Control Policies

6.7.3 The Local Setting

6.8 Local Plans (Master Plans)

6.8.1 Types, Functions, and Contents of Plans

6.8.1.1 Master Plans or Directive Master Plans

6.8.1.2 Detailed Action Area Plans

6.8.2 Preparations of Plans

6.8.3 Approval of the Plans

6.8.4 Alteration of the Plans

6.8.5 Implementation

6.9 Urban Growth Boundary and National Spatial Strategy.

6.9.1 The Main Goals and Contents of UGB

6.9.2 The Urban Growth Boundary Process

6.10 Conclusion

CHAPTER 6 Land Development Control Policies

6.1 Introduction

This chapter consists of three sections. The first section will concentrate on the role of the Ministry of Municipal and Rural Affairs (MOMRA), as this is the body which plays a most important role in physical development, including land development, and environmental improvement, in the Kingdom.

The second section will give a general overall picture of the process by which land becomes available in Saudi Arabia, in order to understand if there are any stated policies which emphasise the protection of the environment while developing the land.

The third section will deal with the legal instruments, and in particular two of the most important tools used by the Saudi government to control land development, which are the local plan (master plan) and the urban growth boundary (UGB), and others in relation to the topic.

Not only will the chapter review the national policies and objectives of MOMRA, and the ways in which these policies and objectives relate to the setting, arrangement, and implementation of the local plan and UGB; it will also assess the extent and quality of the integration of these policies with other policies we have treated in this study, such as national and Islamic policies on the environment, agriculture, and water and environmental policies. The chapter will evaluate the effect or lack of effect of such integration as takes place on the environment in general and on oases in particular.

6.2 The Ministry of Municipal and Rural Affairs (MOMRA): Role Definition and the National Strategy

The organisational structure of MOMRA consists of five deputies, six general directorates, six water and sewage authorities, five main municipalities, 96 town

municipalities, including 2,626 villages and *hijars*, and 43 village clusters serving 2,084 villages and *hijars*.

The responsibilities of MOMRA are divided into nine main programmes as follows:

1. Planning
2. Water
3. Sewage
4. Public parks and playgrounds
5. Markets
6. Public utilities and services
7. Municipal streets and rural access roads
8. Municipal buildings
9. Environmental improvement.

It is clear that one of the duties of MOMRA is environmental improvement. Government organisations receive funding through programmes established in co-operation with the Ministry of Planning (MOP), which are ratified by the Ministry of Finance. Each of these programmes may have sub-programmes, and under each of these sub-programmes individual projects are listed. How the duties and tasks required to fulfil the objectives of each project are distributed is arranged by the particular government body concerned.

6.2.1 The National Strategy of MOMRA

The national strategy for MOMRA can be stated as the following:

- To provide a municipal infrastructure for all the cities, towns, and villages in the country.
- To transfer the provision of basic infrastructures from cities to towns and villages – if deemed suitable – where it is required to improve natural and economic potential, and in this way advance the diversification of the Kingdom's economy.

- To concentrate on rural areas in order to ensure that basic requirements are met for each household and to enhance the economic capacity of these rural areas.
- To put greater emphasis on the completion of municipal infrastructure, and on the operation and completion of this infrastructure (MOMRA, 1997).

6.2.2 Objectives, Policies, and Programmes of MOMRA during the Fifth National Development Plan

The Fifth National Development Plan was a continuation of the previous plans, and it's aims encompassed the following:

Objectives

- Further to improve the equitable distribution of basic municipal infrastructure and services through Saudi Arabia, taking due account of cost effectiveness.
- To provide advanced municipal infrastructure and services to areas with sufficient development prospects and population density.
- To continue the improvement of economic efficiency and the utilisation of municipal infrastructure.
- To stress the spatial development of localities in co-ordination with ministries and with the local authorities concerned.
- To maintain land, natural resources, and environment and utilise them for future generations.

Policies

Three policies can be found set out under the Fifth Plan, which had the following emphases:

- To protect public health, the environment, and natural resources as much as possible from the adverse effects of urbanisation and industrialisation.
- To continue developing regulations controlling land acquisition and the enforcement of land, according to approved plans.

- To carry out research on the appropriate model for cities and villages in Saudi Arabia to ensure that the functional requirements and new technology are consistent with Saudi heritage and the traditional way of life (MOP, 1990).

It is clear that the protection of natural resources and the advance of land development regulations are the main policies and objectives. However, there is still a lack of detail and no full setting out of areas of responsibility.

Programmes: the following priority programs were undertaken:

MOMRA's programmes according to the Fifth National Development Plan are:

- Management and administration
- Operation and maintenance
- Manpower development
- Studies and research
- Water
- Sewage
- Water, drainage, and flood control
- Municipal public utilities and services
- Municipal streets.

6.2.3 Objectives, Policies, and Programmes of MOMRA during the Sixth National Development Plan

The development of the MOMRA sector will be through the objectives, plans, and policies in the Sixth National Plan listed below. This plan covers the years 1996-2000.

Main Objectives

- To rationalise the use of municipal infrastructure and ensure the economic viability of city and village projects.

- To encourage the active involvement of the private sector in the process of development wherever possible, through the implementation of municipal projects.
- To make operations and administration more effective and to improve opportunities for municipal employment. To further Saudisation in all areas of employment and to enhance the performance of Saudi workers through improved training.
- To achieve targets in the delivery of drinking water, to set in place more efficient sewage systems in the highly populated parts of cities and towns, and to achieve as much effectual use as possible of treated waste water.
- To maintain the improvements in the general living circumstances of the Saudi citizen countrywide, in terms of health and environmental matters, and to play a full part in the successful accomplishment of infrastructure objectives needed by other government ministries to carry out their development tasks.

<u>Policies</u>

- To improve and regularly update existing information systems.
- To plan for urban development whether at national or at local level, in collaboration with other bodies.
- To examine the administrative re-structuring of MOMRA and its dependent agencies in the light of the new provincial system.
- To advance the use of modern technology where useful for the handling of waste water.
- To increase the financial resources of municipal agencies in order that they might have sufficient funds to maintain and improve their services and to sustain their infrastructures.
- To recognise and encourage suitable potential aspects for privatisation, and to put in place the regulations to ensure that they are so realised.
- To find suitable methods for the disposal or economic use of waste on the basis of knowledge gleaned from other countries.
- To establish new villages and develop existing ones in order that the services enjoyed at present by town dwellers should also be available for village

dwellers at an economic cost, thereby reducing the gulf between the services provided for urban and for rural residents. (MOP, 1995-2000).

Programmes:the following programs will be undertaken:

- Management and administration
- Operations and maintenance
- Manpower development
- Study and research
- Water supply
- Waste water drainage
- Storm water drainage and flood defence
- Municipal streets
- Municipal utilities and services (MOP, 1995, pp. 375-387).

In considering these policies, objectives, and programmes it is very important to recognise the point that planning for urban development, whether at national or local level, should be in collaboration with other bodies.

The Role of MOMRA

As far as the role of MOMRA is concerned, this body can be singled out as the most important agency as regards involvement in physical planning. In the context of development and planning MOMRA's central level responsibilities are as follows:

1. Physical planning for cities and the provision of roads and utilities.
2. The running of health services and the administration of city amenities, including the general appearance and cleanliness of cities.
3. The administration of operations having to do with the management of land, such as granting, renting, and purchasing land areas for the creation of projects.
4. The growth of villages outside the control of municipal authorities.

Within MOMRA the deputy Minister for Town Planning has the following main duties:

1. In conjunction with the Ministry of Planning, the devising of general growth policies.
2. The carrying out of preliminary surveys in order to prepare development plans.
3. The preparation of development plans at all levels.
4. The monitoring and authorisation of detailed plans for cities within the overall national plan.
5. The assessment of city plans to ensure conformation to regulations.
6. The preparation of planning standards.
7. General oversight of the technical plans, encompassing their preparation, approval, and implementation. This covers such matters as streets and utilities in urban areas.

MOMRA's responsibility also runs to the area of physical development, through the Deputy Minister for Technical Affairs. This ministry deals with the formulation of technical plans, with overseeing the work of consultants, and the construction and maintenance of city streets (Al-Kadi, 1989).

The municipal and rural affairs sector has a significant part to play in reaching Saudi Arabia's development aims of satisfying the basic requirements of the Saudi population and enhancing the quality of their lives. Its activities in relation to national and local growth incorporate the physical planning of cities, towns and village clusters as a whole, the building and running of municipal utility networks (such as streets, water, waste water, and storm water drainage) and facilities (such as souqs, markets, and parks), as well as the maintenance of environmental cleanliness through street cleaning, rubbish collection, and the environmentally safe disposal of garbage.

Over the last twenty-five years of planned development in Saudi Arabia, municipal facilities and services have focused in the main towns and cities. With this major undertaking largely completed, municipal development in the more recent years has been concentrated more and more on provincial towns and village clusters, and the delivery of satisfactory services to as large a portion of the population as possible, thereby halting the trend of population movement to the cities.

The government aims to provide municipal services to all parts of the Kingdom in accordance with the needs of an increasing population. Thus, in many cities and towns, parts of the existing infrastructure have been modernised or substituted because they have become obsolete. At the same time, water, sewage, storm water drainage, and the surfacing, paving, and lighting of urban streets have been further developed to cope with greater need. Through the provision of sanitation services the overall aspect of cities and the character of life within them has been improved.

The sustainable economic growth rates of recent years have also had a positive effect on urban development, as the planning, co-ordination and supervision of public projects have become more viable. Furthermore, land utilisation in urban areas has been increased with the construction of commercial and residential buildings built to take up less space. So municipal infrastructure has been able to provide municipal services to a greater number of town and city residents, even at reduced unit cost.

The pattern of five metropolitan areas *(amanat)* and 96 municipalities has been kept in place in order to concentrate and utilise resources and services more efficiently, although some of the municipalities have been consolidated. A water and sewage department, however, has been set up in Tabuk, bringing the total number to seven. Moreover, the number of village clusters has risen from 43 to 62, with currently around 2,300 member villages, so that a wider rural population has better access to schooling, training, health care, communications, markets and other facilities and services.(MOP, 1995-2000)

The recent demographic changes have led to a new municipal classification system, with the municipalities being re-grouped within five (now reduced to four) categories A to E, as described below.

Class A. Within this class, two types may be identified. The first is the a*manat* which include Makkah, Madinah, Riyadh, Jeddah and Dammam. The second type is class A municipalities, which include Taif and the Municipality of Qassim region. Both types enjoy a considerable amount of autonomy in running their affairs and are directly linked to the minister, because of their special roles and functions.

These cities are the largest urban centres in SA. The municipalities of such cities prepare the master plans of their cities, which must obtain the approval of the minister before they are implemented. In this respect class A municipalities are given some power to initiate land use policies, but the ultimate power is vested in the minister..

Class B. These are established in relatively large towns and have a certain amount of scope for managing their own operations but less than the municipalities in Class A. These municipalities are directly linked to regional offices. Some aspects of planning and development are not dealt with by class B municipalities, in particular the preparation of master plans and the implementation of projects. All other municipal functions and internal administration activities are undertaken by them according to their management capacities.

Class C. This class is like class B municipalities but strongly linked to the regional offices because of the lack of technical and administrative capabilities.

Class D and E. These are extremely dependent on MOMRA's regional offices because of their very limited technical and administrative capabilities. In view of this fact their functions are very restricted. The category of class E municipalities was terminated in 1979 and upgraded to the D class.

Except for class A municipalities, all types of municipalities are directly linked to regional offices, which in turn are linked to MOMRA in Riyadh. Three regional offices were set up in 1977, namely Central Region, Western Region and Eastern Region. A year later additional regional offices were established in Northern Region, Southern Region and Qassim Region. The ministerial directives specified the municipalities of Class B to D which fall under the jurisdiction of each regional office. Each regional office is responsible for all ministerial functions within its administrative area in respect of technical, municipal, rural, land administration, administrative and financial affairs. Co-ordination with MOMRA and other government bodies is sought, but the ministerial orders did not specify any practical measures or division of power to do so.

Village clusters were divided into three categories, B to D. The numbers in each category are shown below:

	A	B	C	D	Total
Amanat					5
Water and Sewage Depts.					7
Municipalities	7	14	46	29	96
Village Clusters		9	25	28	62
Total	7	23	71	57	170

Table 6.1. Types of municipal administration.
Source: MOP (1990), p. 377.

The production of maps of all Saudi cities using digital technology is also underway, in addition to the wider use of land registration schemes.

With the establishment of the new provincial system in the period of the Fifth National Development Plan the municipalities in the various regions of the Kingdom have become more involved in planning development and work in closer liaison with the agencies concerned. Through their institutionalised administrative powers, the provinces (*amarahs*) are now fully entitled to co-ordinate the projects within their remit. With the establishment of this new pattern of methodical planning and its underpinning by a reliable and current information provision system, the municipalities are gaining more administrative and planning autonomy (MOP, 1990).

MOMRA plays a very important part in physical development in addition to the role it plays in relation to environmental improvement. It is clear that one of MOMRA's main objectives is to improve and sustain the quality of life for the people in both urban and rural areas of the Kingdom.

From the discussion and review of MOMRA's objectives, policies, and programmes it can be seen that the emphasis is on the protection of natural resources and the development of land regulation controls. Furthermore, it was stated that planning for urban development, whether at national or local level, should be in collaboration with other bodies. However, it is clear that the objectives, policies, and programmes are not completed comprehensively For example, there is no emphasis on EIA or SEA or

on guidelines for their implementation in MOMRA's programmes or provision of services.

6.3 Land Tenures

In this section it is very important to explain the land tenure system in Saudi Arabia before discussing the process of land development. The types of land tenure are therefore laid out below.

The *shariah* (Islamic law) ordinances permitted three types of land tenure, and these are:

1. Public (government) ownership
2. Private ownership
3. Collective ownership .

The *shariah* states that Allah is the ultimate owner of all things, so that the land too belongs to him, then to his messenger, and then to the Muslim community, which is represented by the Imam (King). All land in the Kingdom of Saudi Arabia, then, which is not in the hands of a private individual is considered to be publicly owned (*miri*), meaning that it is under the King's control. There are two classes of publicly owned land in this category, described below.

The first of these is land that has been allocated by royal decree to various ministries according to their requirements. The second class covers all remaining public land, controlled by the King. From this land the King grants areas either to private individuals or to public bodies for the purposes of development.

As for private ownership (*milk*), private individuals can still have the privilege of ownership, although ultimately all land belongs to Allah. It is this kind of ownership that accounts for most land in urban areas. As elsewhere, the ownership of such land can be disposed of by selling, or it can be inherited by children. The current position in Saudi Arabia is that land may only be owned by Saudi nationals. A further class of

private ownership is mortmain property (*waqf*) which is generally under the management of religious institutions.

The third class of ownership, collective ownership, applies mainly in the case of temporary agricultural use. Lands held under this type of ownership are for the most part to be found on the edge of urban areas (Al-Yemeni, 1986; Al-Shihri, 1993).

6.4 The Process of Providing Land

In the Kingdom of Saudi Arabia urban development passes through several stages, each of which has its own modus and its own mechanisms.

In addition to the normal market procedure by which someone can purchase the land he requires, there are two main paths along which undeveloped virgin land is taken for urban development (Al-Yemeni, 1986; Al-Rahman, 1985; Al-Shihri, 1993).

6.4.1 The Direct Process

By this method the King bestows land in both large and small portions upon individuals, groups, or institutions in order to develop the land for residential, administrative, or commercial ends.

1. Land Grants for Housing

Initially an application for a plot is submitted to the Royal Cabinet by an individual or a group. Some formalities are conducted through MOMRA while the applicant then approaches the municipality, which holds a number of plots for housing purposes in various parts of the city for which it responsible. When the applicant receives his plot the relevant property title is obtained from *Kitabat Al-Adl* (in the Ministry of Justice). A grant may be awarded in the case of limited income, as well as on various other grounds. No specific preconditions are set in the case of limited income, but rather each case is determined on merit. On other cases the applicant might be a person of

sufficient standing deemed suitable by the Royal Cabinet. Under these circumstances the piece of land might be allocated by the municipality at local level, or it might be requested by the applicant and granted by the Royal Cabinet.

2. Land Grants for Commercial or Industrial Use

There are two types of applicant in this category: large scale industrial users, and individual commercial and industrial users. The procedure involved is similar to that described above for residential land applications, but in this case the land is granted for a specific type of plant or industrial/commercial use. A condition is commonly placed on the grant to the effect that the projected development must be carried out within a two-year period. In many cases, however, successful applicants have held the grant for longer than this period without undertaking any developments, and indeed in some instances have even succeeded in selling the land on the market.

3. Grants of Land to Public or Semi-public Institutions

The arrangement is that the institution puts in its request for a particular site, which should be already under public ownership. The location will be allocated to the applicant by the Ministry of Finance and National Economy after the boundaries have been suitably determined at local level.

6.4.2 The Indirect Process

This can be categorised in several ways.

1. Grant by the King

Nearly all the large estates in Saudi Arabia not under public use have been granted by the King to officials, dignitaries, and members of the Royal Family. This kind of practice is not new in the Islamic world.(Al-yemeni, 1986)

2. Sale of Undeveloped Land

This type of sale is usually conducted through an estate agent, who is the one who actually sells to the public. If the price is in excess of the estate agent's personal capital, and it may well be since it can amount to millions of Saudi Riyals, he creates a joint stock company or *mushama*. The procedure is controlled by well established rules. Firstly notice of the intended formation of the *mushama* is placed in the newspapers and people are invited to buy shares at a set price from the estate agent concerned. Then the land is bought by a company if the required capital amount is reached. The estate agent takes his share, a commission of from 2.5% to 5% of the shares. Shareholders are each allocated a set amount of land per share, but the location of the land is not pre-determined.

3. Subdivision and Resale of Land Plots

Following upon the acquisition of land the agent's responsibilities then include submitting the application for subdivision to the Town Planning Office, and to the appropriate agencies for the required infrastructures – roads, water, electricity, sewage, and telephones.

The sale of subdivided land, which can go ahead as soon as the subdivision plan is approved and the plots are marked on the land area, is decided by the agent or by the shareholder. It is not uncommon for the sale to take place before the various elements of the infrastructure are in place. The only visible sign of development on the day of sale may be the asphalting of the main street, so that potential buyers will have some notion of how the place will look.

The sale is advertised in the press, with an indication of the date of sale and of where the subdivisions are. The price paid does not so much reflect the actual value of the land but rather the general way the market is going at the time. The actual location of sale may vary; it can be in the estate agent's office or even on the site itself, when sales are by auction. The company that had been formed is dissolved once all the plots of land have been sold, and each shareholder receives his share. The estate agent receives another fee again amounting to 2.5% to 5% of the profit on each sale.

When the buyer pays he gets a deed registered with the *Kitabat Al-Adad* and is then the legal owner of the plot.

6.5 Improvement of the Land

This is a process which goes through two essential stages, namely land subdivision and the setting up of the elements of the infrastructure, i.e. the provision of services and utilities.

6.5.1 Land Subdivision

Subdivision permits are required for all land subdivision. It is permitted to subdivide all land within the master plan area, with the proviso that the subdivision plan is in line with the rules established by the supreme steering committee. The subdivision plan may either be prepared by the applicant himself and submitted to the municipality or it may even be prepared by the Planning Department of the municipality itself on the applicant's behalf.

The area appointed for streets and other community facilities amounts to one third of the total land area in this context. The main concern in preparing a land subdivision plan is the establishment of the main street right of way, plot size, and land usage as specified by the master plan (zoning ordinance) (Al-Shihri, 1993; MOMRA, 1990; Al-Rahman, 1985).

6.5.2 The Construction of Public Utilities and Community Facilities

Private developers of land subdivision do not contribute financially to the construction of utilities and community facilities. These items are the responsibility of the municipality (Al-Yemeni, 1986; Al-Shihri, 1993).

6.6 Construction of Building

The construction of new buildings or the major repair and/or maintenance of existing buildings, as opposed to a major development such as shopping complexes, administrative buildings, and so on, requires a building permit, issued by the municipality. These are dealt with by the Department of Permits and Building. Applications must be duly accompanied by title deeds (or copies), approved subdivision plans if these exist, site plans, and construction plans (architectural, structural, sanitary, electrical, mechanical, and other relevant drawings) prepared properly by a professional architect, engineer, or surveyor. Normally the municipality or the sub-municipality involved sends an architect or a surveyor. If things are in order, a building permit is issued (Al-Yemeni; 1986, Al-Shihri, 1993).

From our review of the processes of providing land, improvement of land, and construction stages, it is clear that there are no clear policies or requirements to submit any studies related to the environmental impact of land improvement or construction.

6.7 The Setting of Planning Legislation

6.7.1 The National Setting

In the Kingdom of Saudi Arabia, although it is put into operation locally, planning legislation is formulated at the national level (Figure. 6.1). The King, The Custodian of the Two Holy Mosques, is the highest legislative, executive and judicial authority. As such he issues orders to the Crown Prince, the Council of Ministers and all other ministries in respect of any planning affairs. A direct lower authority is the Crown Prince, who also issues directives and orders as and when necessary. Similarly, the Council of Ministers, a solely legislative body chaired by the King or the First Deputy Premier, promulgates laws, ordinances, and resolutions related to all matters, including urban planning. These three sources constitute what may be termed 'primary legislation'. In the light of this primary legislation, MOMRA acts as the

primary implementing agency but with limited legislative authority. MOMRA ommunicates circulars, instructions, and administrative decisions, which may be called 'secondary legislation', to regulate development in urban areas. At the bottom of the hierarchy lie the municipalities, with constrained legislative power, whose task is to implement planning law. MOMRA is thus organised in a two-tier system: first

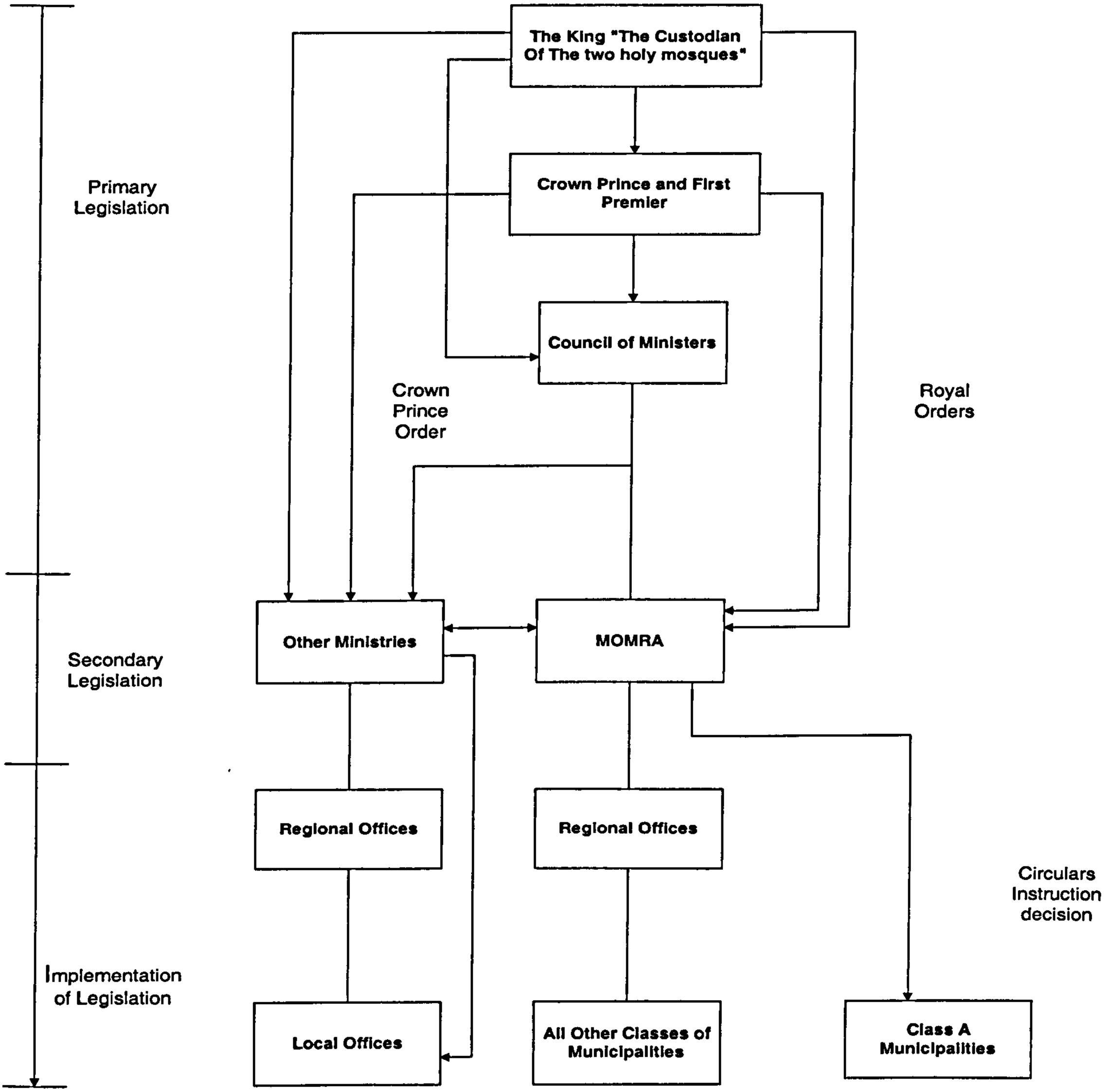


Figure 6.1. The legislative and executive framework of planning.
Siurce: Abdulaal and Al-Rahman (1997).

there is the Ministry itself, and second are the municipalities. As the executive and administration power in his organisation, the minister is charged with the duty of maintaining consistency and improvement in the formulation of the secondary planning law as related to the use and development of land (in addition to other things) and has the right to amend master plans. At the other end are the municipalities, which are responsible for the implementation of planning legislation (see figure 6.2).

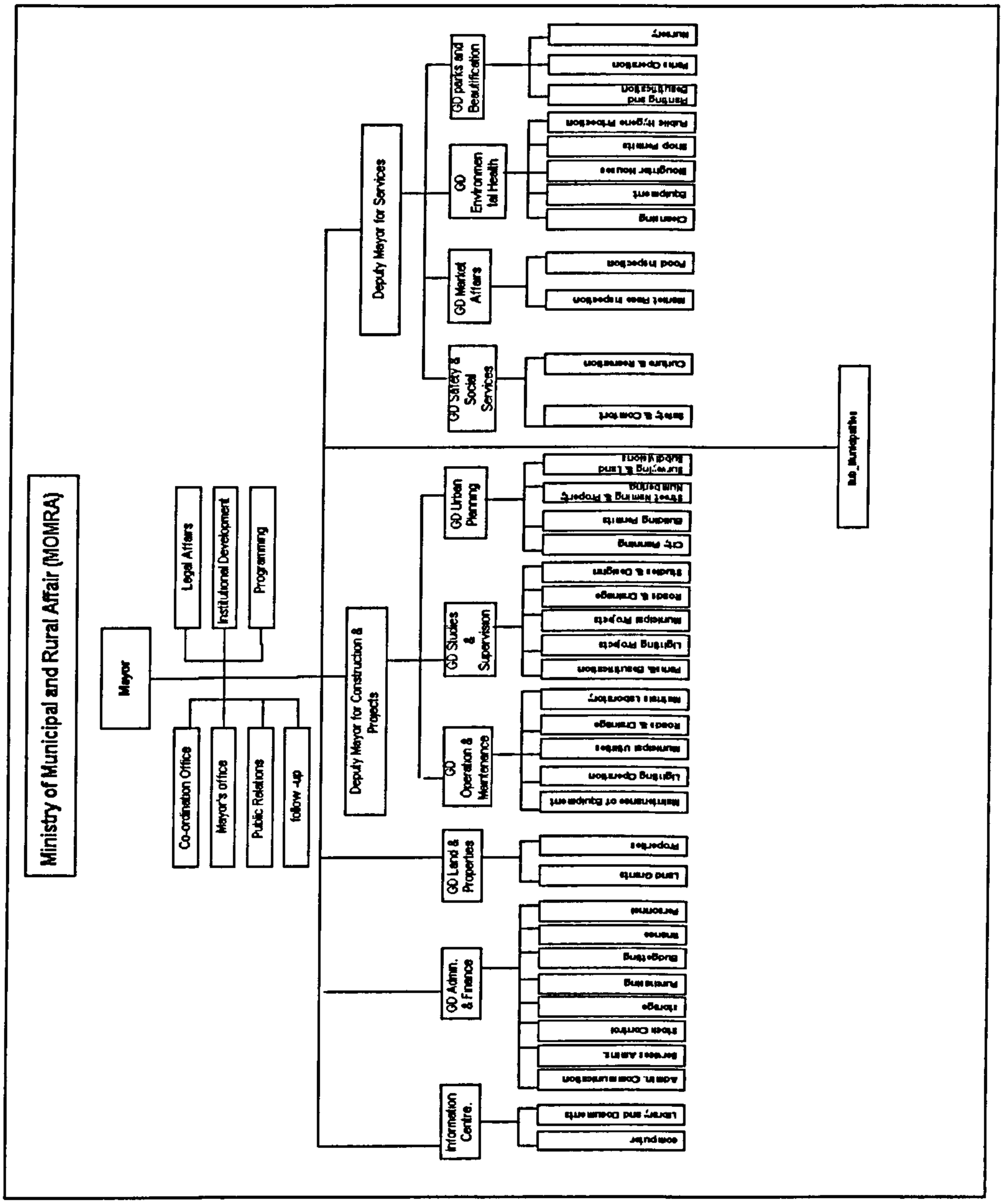


Figure 6.2. Organisation of *amanat* and Class A municipalities (1991).
Sources: Abdulaal, and Al-Rahman (1997).

A municipality is presided over by the Mayor, who is directly answerable to the Minister of MOMRA. At the local level the Mayor exerts considerable power, with control over all department in the organisation. He is assisted by two Deputy Mayors, one with responsibility for construction and projects and other with responsibility for services. Sub-municipalities follow a similar, but simpler, arrangement (see Figure 6.3).

Municipalities undertake diverse functions, which include land policy measures, urban planning, building permits, and land subdivision, together with other municipal functions such as environmental health, market place inspection, cleansing. Various additional municipal duties are incorporated in other legislation (see Table 6.2 and Figure 6.2).

6.7.2 The Regional Setting (The *Amarah*)

The *Amarah* was designed to be the regional government. The Amir is appointed by the King and he is the latter's representative in the region. The Amir's power is therefore delegated from the King, by whose authority he administers the region according to general government policy. He is also responsible for carrying out *shariah* Court decisions, preserving law and order, and, particularly important, he chairs the Regional Council charged with the general supervision of development in the region. In the case of any directives to be issued to local offices, however, the Amir is required to refer to the ministries concerned.

Structurally the office of the Amir (*Diwan Al Amarah*) is organised by the Amir himself to carry out his responsibilities, and the Deputy Amir, also an appointee of the King, represents and assists the Amir in the performance of his duties and functions. The *Amarah* is mainly concerned with civil rights, civil defence, local police, and the general management of the regional development.

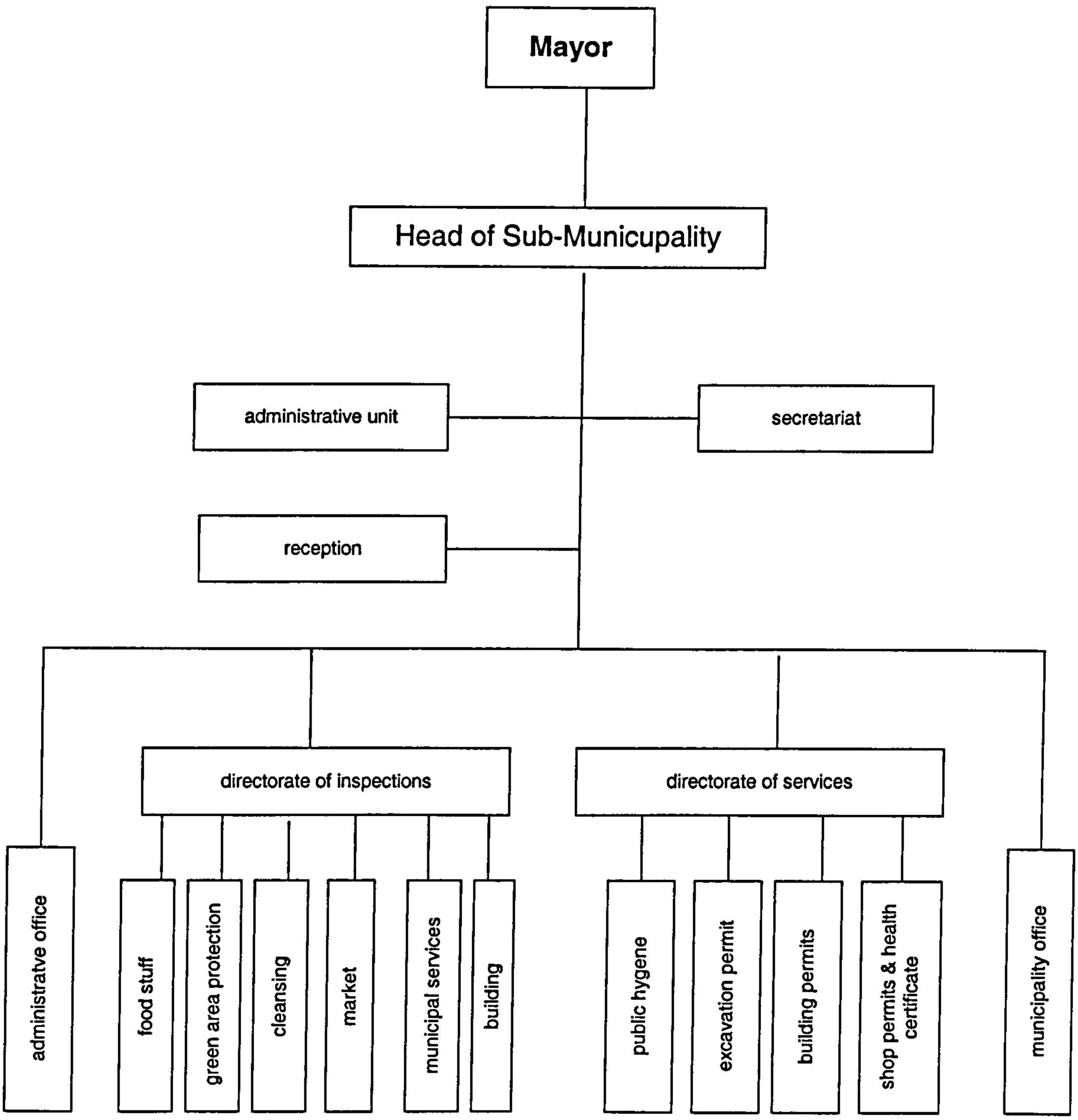


Figure 6.3. Present administrative structure of a sub-municipality.
Source: Abdulaal, and Al-Rahman (1997).

Several legislative measures have been passed in relation to regional control. They include the following:

- Administrative Governors and Administrative Councils (1939), which highlighted the duties and responsibilities of Governors and the powers of Administrative Councils.

- The Provincial Law (1963), which enlarged on the division of provinces and defined the duties of and responsibilities of Governors and Provincial Councils. Provincial Councils, however, only came into operation following the Law of Provinces of 1992.
- The Law of Provinces (1992), mentioned above, provides for the Amir to preside over the Provincial Council, consisting of representatives of government agencies and others nominated by the Prime Minister on the recommendation of the Governor and with the approval of the Minister of the Interior. This minister has issued detailed rules controlling the function of Provincial Councils.

6.7.3 The Local Setting

At local level the administrative structure consists of branches of all ministries with diverse responsibilities and powers. Some of the government agencies associated with planning and development at city level are indicated in Table 6.3.

In general local government offices are responsible for:

- Supervision and control of the implementation of ministerial policies, ordinances, and projects.
- Preparation of the regional budget, which includes relevant projects and programmes. Each agency has to send its budget to its central ministry in Riyadh for approval.
- Preparing periodic reports on their achievements, which are sent to their central ministries.(Abdulaal, and Al-Rahman, 1997).

It is important to emphasise that each of the regional branches of central ministries works independently of the others. There is therefore, despite co-ordination through the Regional Council, fragmentation of responsibility. Infrastructure provision, for example, is split among authorities working on their own: water and sewerage are dealt with independently of the supply of electricity, and the building of roads is undertaken by two separate bodies, MOMRA and the Department of Roads of the Ministry of Communications (Al-Kadi, 1989; Abdulaal, 1997; Al-Shihri, 1993).

Functions stipulated in the Law of Municipalities and Villages (1977)	Function stipulated in other legislation
1- General controls - Master plans	Land Registry -Urban growth boundary -Zoning -Land subdivisions
2- Direct control without taking land	-Planning standards
3- Direct control by taking the land -Expropriation	
4- Public land tenure -Protection of land from encroachment and squatting.	Management of -Land grants -Sale of public land -Renting of public land Control of left-over spaces -Land revival -Land allocation for public agencies
5- Land use management and control -Recreation areas -Markets and commercial areas -Slaughter houses -Operation permits for workshops, and factories -Unfit buildings -Protection of historical and cultural buildings -Operation permits for premises causing discomfort, nuisance and health hazards -Control of vendors, places and their vans	-Other land uses
6- Public utilities -Installation -Drainage of rainwater	-Management and co-ordination with other agencies
7- Miscellaneous -Environmental health -City cleansing and refuse collections.	-Hadj related functions -Street furniture -Street naming and property numbering -Management of state funded housing in some towns and villages -Transportation -Settlement of nomads

Table 6.2. Municipal functions.
Source: Abdulaal (1997).

Serial	Government Agency	Responsibility for Urban Development
1	Department of Water and Sewerage	Water and sewerage networks
2	Department of Roads, Ministry of Communication	Building of ring roads and motorways
3	Company of Electricity, Ministry of Industry and Electricity	Electricity supply
4	Branch of Ministry of Health, Ministry of Health	Health affairs, e.g hospitals, clinics.
5	Real estate Development Fund (REDF)	Interest-free housing loans
6	Ministry of Justice	Land Titles Registry, approving *Ilya Waqf* management, juding land conflicts, etc.
7	Directorate of Education, Ministry of Education	Building and management of boys' schools
8	Directorate of Girls' Education, Presidency of Girls' Education	Building and management of girls' schools
9	Directorate of Pilgrimage, Ministry of Pilgrimage	Hadj affairs
10	Directorate of *Waqf* and Mosques, Ministry of Islamic Affiars and Endowments	Building and management of mosques
11	Directorate of Agriculture, Ministry of Agriculture	Supervision of agricultural land and undergound water resources
12	Directorate of Hadj, Ministry of Hadj	Supervison of Hadj affairs
13	Saudi Telecom, Ministry of PTT	Telecommunications
14	Arabian American Oil Company (ARAMCO)	Oversight of oil development plans
15	Royal Commission for Jubail and Yanbu	Control of development within area

Table 6.3. Responsibilities of local branches of central ministries for urban development
Source: Al-Kadi (1989), Abdulaal (1997)

As far as Al-Qatif oasis and its settlements are concerned, these are the responsibility of the class A municipalities (the *Amanat*) of the Eastern Province, which is located in Dammam city. This body is in charge of the planning of all cities in the Eastern Province.

The Urban Planning Department of Dammam *Amanah* carries out the responsibility of the ministry at local and regional level. These responsibilities include data gathering, the preparation of master plans and action area plans, the preparation of land subdivision, advising local municipalities and private developers on the location of major projects, and the co-ordination of planning and development at the regional and local level. The *Amanah* also provides input for the preparation of national plans.

Since primary planning law is formulated at the centre, it is unrealistic to assume that implementers act as exclusive agents for policy makers. Instead legislation and its implementation interrelate and the relationship between them becomes circular rather than linear (Abdulaal and Al-Rahman, 1997).

Implementation is furthermore a complex multi-phase affair, with decisions having to be taken by different persons and at different points. This is extremely hard to co-ordinate, and is further complicated by the fact that the interests of municipalities may clash with those of the bodies with whom they have to co-operate in urban planning, and who may have their own agenda and priorities. There is no overall body of rules or legislation laying down responsibilities which require co-ordination.

6.8 Local Plans (Master Plans)

As discussed in Chapter Two, which dealt with urbanisation and planning levels in Saudi Arabia and the history of the planning process in the Kingdom, the Saudi government in the late 1960s felt an acute need to curb and direct urban growth. The capital, Riyadh, was the fastest growing city in the country, and the most important from the point of view of the government. In 1968, therefore, Doxiadis Associates undertook the task of planning. The final plan was submitted in 1971 and was approved by the Council of Ministers in 1973 (see Chapter Three, Section 3.4.2).

It was not until 1977 when Ministerial Circular (2) No. 1226 appeared that master plans were defined as the main framework for city development (Abdulaal and Al-Rahman, 1997). However Bruton and Nicholson (1987) argue that a local plan has to be more than just a framework, since it goes into detail with maps, written statements, and so on, as far as development control and future development proposals are concerned.

6.8.1 Type, Functions, and Contents of Plans

Abdulaal and Al-Rahman (1997) have pointed out that planning authorities have an amount of discretion regarding the type and range of the plan to prepare, though there is some limited supervision from MOMRA for large city municipalities and closer control over other towns. In actual fact the 1971 legislation and the 1977 legislation make mention of one type of plan, the master plan. MOMRA, however, identified two types of plan in 1977. These are discussed below.

6.8.1.1 Master Plans or Directive Master Plans

This takes in the city and is based on a thorough assessment of physical, social, and economic factors affecting the development of urban areas. These plans generally provide guidance on development control, as well as information to municipality professionals about the allocation of sites for specific purposes. Policies in a master plan are intended to guide the co-ordination of a municipality's actions with other government bodies. There has been no time scale laid down for master plans in the basic legislation, and master plans, old and new, have been around for 15 to 20 years now. Some areas have no plans at all, according to a circular dated 1983. In order to deal with this situation, steps have been taken in the form of circulars sent to the local planning authorities to get them to plan for the unplanned areas in conjunction with the Deputy Ministry for Town Planning (DMTP).

6.8.1.2 Detailed Action Area Plans

Some specific areas are picked out for study, and these plans relate to them. While not controlled by legislation, they seek to direct the comprehensive planning of selected areas. The drawing up of an action area plan for any given area is not always a decision made by a planning authority. The need for such a plan or for alternative policies to be included within the master plan may be established by an acceptance that action area plans are required for areas that call for large-scale changes. Such a plan may involve the planning of new development areas, as well as redevelopment and improvements to areas already in existence. Whether such a plan was very detailed or not would depend on its purpose, and there are technical details provided under Ministerial Circular No. 1226, issued in 1977, which give guidelines for the preparation of action area plans. The exact form and content, however, are not laid down.

Since legislation does not prescribe a time limit for the implementation of an action plan, it has been customary to include them as part of a master plan, in which a time scale for action is usually laid down. Proposed action areas plans should, it is to be expected, be consistent with the master plan of which they are part (Al-Hathloul, and Ur-Rahman, 1985; Abdulaal, and Al-Rahman, 1997).

6.8.2 Preparation of Plans

In general the preparation of plans is supposed to be the responsibility of the planning authorities (class A municipalities or the regional offices). It has been laid down, however, by the first section of Town Planning Article 5 in the Law of Road and Buildings of (1940) that a technical committee should be set up before the drawing up of town plans. It was not laid down what the membership of the committee should be (Al-Kadi, 1989). Abdulaal and Al-Rahman (1997) argue that, while the law lays down that master plans should be approved by the relevant authorities, it does not describe the title, nature, area, and scope of local plans or their programme of preparation.

In this context it is also argued by Al-Kadi (1988) that the law controlling municipalities and villages promulgated by the Royal Decree No. M/5 in 1977

mentions that one of the responsibilities of the municipal council is participation in the master plan. This is in line with the decision of MOMRA No. 4018 in 1977 and 39/6 in 1978 for the establishment of the Directorate of Municipal and Rural Affairs.

It is further pointed out by Abdulaal and Al-Rahman (1997) that subordinate legislation has given legal provision to aid in plan preparation. For example Ministerial Circular No. 312/5 (1975) facilitated the process of communication between local planning authorities and the DMTP so that the preparation of plans could be make easier and swifter. No stipulation, however, for an overall procedure for preparing local plans was made.

In the course of plan preparation consultation with other government agencies is necessary. MOMRA stressed in 1983 the need for co-ordination and co-operation between planning authorities and the Ministry of Communications as far as roads were concerned (circular No. 81/5). This is not actually laid down in the law, but it is a practical reality. The preparation of a master plan may be assumed to require consultation with other government agencies, not just the Ministry of Communication. This has been supported by Seers (1972) in Conyers and Hill (1984), in his statement that there were problems arising from the nature of the relationship between the politician, the planner, and the traditional administrator, what he calls 'the basic triangle of forces'. He states:

> Though each of this trio may play his role quite reasonably by his own light, the outcome is often nonetheless quite irrational, because of basic differences in the way they approach their joint task, due to differences in the education and experience which have moulded them. (p.43)

Abdulaal and Al-Rahman (1997) support this by saying: 'Legislation does not enumerate the necessary inputs of the other concerned authorities in the master plan preparation.' (p. 122)

In practice planning authorities (municipalities) generally seek the services of planning consultants to prepare their plans on the basis of a legally binding agreement. The work to be done in the preparation of local plans is laid out clearly in the contractual agreement. A common format lies behind most master plans prepared

for various towns and cities in the country after the year 1977. Each such plan consists of 15 technical reports, eight of them dealing with background studies, socio-economic analysis, traffic and circulation, physical conditions, and assessment of the existing master plan. It is normal to include in such reports the survey and analysis phases in the planning process because of the considerable differences between the social, economic, and physical characteristics of different urban areas. Background information has to be collected in order to decide the potential and need for change in any one area. Information gleaned will be used for developing future objectives, policies, and programmes, which are dealt with in the remaining seven reports, handling applied aspects of urban planning through the preparation of specific future development plans (Al-Hathloul and Ur-Rahman, 1985; Abdulaal and Al-Rahman, 1997).

Al-Kadi (1985) points out that there was no actual requirement under the laws relating to roads and building or any other piece of legislature to conduct surveys for the preparation of master plans. There were just three ministerial directives from MOMRA, Nos. 221/5 in 1975, 592 in 1976, and 81 in 1977, seeking the following surveys in connection with small settlements only:

1. A comprehensive survey of cultivated areas in order to ensure that they are land areas of prime quality as far as agriculture is concerned.
2. A survey on the availability of actual residential settlement.

Al-Kadi adds that neither the law of Roads and Building nor any other law asks the relevant authorities to prepare a draft master plan to be put forward for citizen participation.

Waterston (1965) argues that 'there is general agreement that information about natural and human resources is a primary requirement for development planning' (p. 173).

6.8.3 Approval of the Plans

According to the first section of Article 5 of the Law of Road and Building (1941) the plan has to be approved by the bodies concerned, presumably the municipality at the local level, and by central government.

It is laid down in the 1937 and 1977 codes that municipalities should be administered in a two-tier system, i.e. the Mayor and the municipal council. The Mayor is to hold executive functions, and the council supervisory functions. As far as local plans are concerned the Mayor has to submit to the council any proposed plans for approval, and they are then sent on to MOMRA (Al-Kadi, 1989; Abdulaal and Al-Rahman, 1997).

In actual practice municipalities (in their capacity as planning authorities) are used to consulting other government agencies concerned with city development when preparing local plans, though they are not obliged to do so by law. This practice of consultation is to everyone's benefit, since it enables the local authorities to keep abreast of which policies of government agencies need to be encompassed by the local plan. In recognition of the mutual and overall benefit of this practice, a legislative framework may well be established to ensure its continuity and proper structuring (Abdulaal and Al-Rahman, 1997).

Locally, the plan's proposals are discussed by a committee called the Higher Co-ordination Committee (HCC) on which the government agencies involved are represented. The HCC seeks to bring together the standpoints of the various interested parties. Following the resolution of any differences the planning authorities accept any amendments made and give their backing to the plan for submission to MOMRA. There is also an even more effective co-ordinating instrument in the Law of Provinces (1993), which requires the provincial council to discuss planning matters relating to the region.

The plan is merely a proposal until it is ratified by MOMRA, who may make amendments before giving assent to it.

However, it is arguable that the plans are not given enough of a public airing through this discussion and approval system outlined above (Al-Shihri, 1993; Al-Kadi, 1989; Abdulaal and Al-Rahman, 1997). Al-Kadi (1989) lends his support to this viewpoint by stating that the first section of Article 5 of the Law of Roads and Building did not consider the objections of citizens after the final approval of the master plan. The public, however, along with politicians, and administrators are a very important factor in plan preparation and execution and it is vital to give them a chance to contribute to its design (Conyers and Hills, 1984, Waterston, 1965).

Selman (1996) writes in the same vein:

> Participation by the public is seen to increase the legitimacy of the planning process, lead to the production of better informed decisions, and raise public interest in planning matters. (p. 123)

He adds:

> The more progressive work which has taken place on public participation will thus be of major relevance to local sustainability. (p. 124)

And it must be borne in mind that sustainability and sustainable development are of central importance to this study (see Chapter 2, Sections 2.2 and 2.3).

Marshall (1985) shares this view too. He writes:

> Plans and strategies, just like goals and objectives, require updating and amending. They must be subject to close public scrutiny. (p. 102)

Not getting the ordinary citizens of the Kingdom involved in the planning process has had a very deleterious effect during the time when foreign consultants started the local plans. The matter, however, has not gone unacknowledged, and the question of public participation in decision making and plan preparation has been well discussed in the country.

6.8.4 Alteration of the Plans

After it was noticed that allowance was made for the alteration of plans by the Law of Roads and Buildings, Section2, Article 22, which states that maps which have already been approved may in fact be altered if the alteration is found to be to the benefit of the public, eleven MOMRA ministerial directives followed, banning the alteration of approved plans unless they are both very minor alterations and of great importance. These directives are:

Directive No. 124/5 in 1973,

Directive No. 55/5 in 1977,

وجهة نظر

مشاري عبدالله النعيم*

مشاركة المجتمع في صنع القرار العمراني

■ من البديهيات ان يكون هدف اي قرار تخطيطي او عمراني هو خدمة الانسان والمجتمع.. حتى تلك القرارات البعيدة الأمد التي ترمي الى التنمية الاقتصادية والعمرانية وتوفير سبل الحياة الكريمة للاجيال القادمة.. فاذا كان الانسان رائحته وقدمه.. توعيته وتعليمه.. هو الهدف الاساسي لأي خطة تنموية.. اذاً فمن الأولى ان يكون لهذا الانسان دور بارز في صنع هذه الخطة..

في بلادنا العزيزة هناك هدف جوهري.. هو تنمية الانسان الذي يعيش على أرضها وتوفير سبل الحياة الرغدة الآمنة شرط اساسي لربطه بالمكان.. الوطن الذي يعيش على أرضه.. اذ انه.. اي الانسان.. عندما يشعر انه قادر على الدفاع عن مصالحه الخاصة والعامة عن طريق المشاركة الفاعلة في صنع القرارات المرتبطة بالتنمية.. سيتولد لديه الشعور بالمكان وساكنيه.. كل جزء من المكان يصبح هنا جزءاً منه.. وكل المكان يمثل له الماضي والحاضر والمستقبل.. ارتباطه بساكني المكان.. لابد ان يكون ايجابياً. فهناك وحدة الهدف الخاص والعام.. التنمية.. الرغبة في عدم تضارب المصالح.. لا تعتقد اخي القارىء انني اجعل للجانب المادي السلطة العليا في نهضة وتطور المجتمع.. ولكنها الحقيقة التي لا مناص من ذكرها.. وهي ان الانسان بطبيعته تواق لان يطور علاقات ايجابية في محيطة تصب مباشرة في مصالحه الخاصة.. حتى مدننا القديمة.. عندما كان القرار العمراني مبنياً على انفاق الناس.. كان الجار يربطه بجيرانه علاقة طيبة.. أولاً لحق الجوار.. وثانياً حتى يتقاضى الجيران

Figure 6.4. An article in the public newspaper entitled 'Society's Participation in Urban Development Decision Making' showing the importance of the participation of the public in the urban development decision making process. The article points out that, since urban development decisions are made to provide the required services for the public, the public has a very important role in this process.
Source: Al-Riyadh newspaper, No. 10678, 18/9/97.

Directive No. 452/5 in 1975,

Directive No. 373/5 in 1976,

Directive No. 121/5 in 1978,

Directive No. 3389 in 1978,

Directive No. 2054 in 1979,

Directive No. 232/5 in 1980,

Directive No. 291/5 in 1983,

Directive No. 327/5 in 1983, and

Directive No. 38/5 in 1983 (Al-Kadi, 1989).

Only the last two of these directives set out procedures for the amendment of plans on the initiative of local authorities with strong reasons for their requests, and these have to be approved by MOMRA.

The amendment procedures set out are these:
Reasons and justifications for amendments should be put before the Secondary Committee, a committee made up of a representative of the Governate, the deputy Director-General, the Mayor, and other Ministry representatives. The proposals of this committee are then put to the High Committee, in whose hands the decision will rest. This High Committee consists of the Governor, the Director, representatives of the central Ministry, the Mayor, and other Ministry representatives (Al-Shihri, 1993).

6.8.5 Implementation

Implementation of the local plans follows upon the necessary authorisation, with a framework for organisation and co-operation being set up locally. One of the areas of responsibility of municipalities is to make certain that urban growth takes place as laid down in the master plan. But when it comes to implementation of a local plan, there would also be input from branches of other ministries at local level. Amongst those represented would be the Ministries of Education, Health, Public Works, and Housing, and the Department of Agriculture and Water, all of which bodies play an important part in urban development.

In the year 1974, following a perceived need for co-ordination between municipalities and the government bodies involved both during plan preparation and plan implementation, a set of procedures was laid out for all government bodies in Riyadh

to control the proposition of development projects. This was Circular No. 292/5 (1974). MOMRA again stressed the need for co-operation through a ministerial circular in 1976, which asked municipalities to send details of their master plans to the electricity companies, so that the limits of urban growth might be taken into account as laid down in Circular No. 384/5 (1976). In the same vein the need to co-operate and co-ordinate activities with other government bodies was reiterated, one instance being the requirement to work together with the Ministry of Communication concerning intercity highways. There are, of course, other government and utility bodies participating in local plans with whom it is important to co-operate, but consultation with them is not a legal requirement. Urban development, then, is under the piecemeal control of a number of authorities and other potential participants, but the commitment of some of these bodies is at times less than wholehearted (Al-Kadi, 1989; Abdulaal and Al-Rahman, 1997).

Waterston argues that some of the problems of plan implementation can be attributed to the tendency to see planning and implementation as two unrelated things. He writes:

> The word 'planning' is often used to refer to the formulation of plans, but not to their implementation. The conceptual separation of 'planning' from 'implementation' is more than a matter of semantics; it is symbolic of an attitude which prevails widely among planners. (1965, p. 336)

He adds:

> Experience shows that nothing is more conducive to bad planning than the separation of plan formulation from provision for, and follow up on, its implementation. Nothing can be more parochial than restricting the planning function to the mere manufacture of plans without reference to what is needed for their implementation. (p. 336)

This, however, is what actually happened in Saudi Arabia. When the original master plans were drawn up the organisation of urban planning, both at central government level and at the level of the municipality, was new. Much of the work connected with the planning was contracted out to foreign consultants, as there were at that time few Saudi professionals in the fields involved. The main initial concern was to set up a

planning framework for cities in the form of master plans, something which was, quite naturally, first done for the major cities. Though it has now also been done for other cities, Planning effort was focused largely on plan preparation (Abdulaal and Al-Rahman, 1997).

What is more, there was no proper organisation of planning at the time. Waterston states: 'The successful implementation of a plan is largely a matter of proper organisation and administration.' (1965, p. 339) But it was not at that time fully appreciated what the relationship should be between plan preparation and implementation. It was not set out in respect of local plans who was to carry what responsibility, or even who was going to take part in the carrying out of a plan. The burst of growth in development in Saudi Arabia during the period 1973-1983 was not anticipated in some of the local plans, and as a consequence of this development problems featured largely in Saudi cities and towns (see Chapter 3).

On the whole point of the failure to implement plans and programmes Abdulaal and Al-Rahman (1997) comment that one of the difficulties is that there is no overall agency established to control the entire process. They write:

> Superficial administrative co-ordination between municipalities and other agencies at the local level exacerbates difficulties in enforcing planning legislation. Moreover there is no single government body which exercises total control and no comprehensive source which integrates legislation related to urban development. (p. 71)

The problems associated with urban growth and spread were recognised by the government, and in an effort to contain it and preserve the environment they set up urban growth boundaries (UGBs). The assumption is that these UGBs will help in putting master plans into application.

Local plans are one of a series of policy instruments, which also include UGBs, land use zoning, land subdivision, development control, and specific area plans, through which the towns and cities in Saudi Arabia contribute to national and regional development (Abdulaal and Al-Rahman, 1989).

All the way through the whole local planning process, from conception and preparation to final implementation, it is clear that there is a lack of attention paid to the environment as a whole and especially to oasis areas.

The problem lies in the fact that environmental assessment is not a mandatory requirement, and there are no ministerial directives or requirements that plans have to be approved by the MCE. While in the Five Year Plans there is an emphasis on EIA, there is little co-ordination with the Ministry of Agriculture to approve the plan if it is not going to affect agriculture. The policies place no stress on co-ordination between the Ministry of Agriculture and MOMRA as far as studying the environmental impact of the plan is concerned.

On the whole local plan policies have general content and have no specific aim of achieving sustainable development. Local plans need period reviewing where they have not touched upon plan review and assessment. Bina (1998) backs up this view:

> The land use policies and proposals contained in the master plan of many urban centers are at fairly generalized levels . . . all these measures should be re-evaluated at some point in time to determine their effectiveness. (p.13)

At the level of plan preparation there is, as far as policy is concerned, co-ordination between MOMRA, the Ministries of Transport and Education and other services ministries to provide the various services. This co-ordination is very poor in reality, however, and this has negative consequences for plan implementation. (Abdulaal and Al-Rahman (1997); Al-Kadi, 1989).

There is some evidence to show the outcome of applying local plans without making a proper environmental assessment, such as situating a residential complex in a naturally sensitive area like a valley. When it rains, the residents complain that the water ruins their houses (Al-Jazeera newspaper, 1998).

In the Fifth National Development Plan Section 15.4 ('Development and the Environment') speaks of the aim 'to protect the environment and its natural characteristics and ecosystems and to safeguard natural resources'. The Fifth Plan

also stressed that environmental impact assessment was to become an integral part of feasibility studies for all proposed plans and projects. The Sixth Plan, currently underway, lays emphasis on the management of land use and environmental information and data, something which has not always been given due weight in the preparation of plans.

Environmental protection has now become a very significant issue in Saudi Arabia, having reached the realm of public exposure in the press. Newspapers have stressed the importance of co-operation amongst MOMRA and the Ministry of Agriculture and Water and other government bodies to enhance residential surroundings. They have in mind the preservation of existing green areas, not just in an urban setting but in the Kingdom as a whole, something of crucial interest in a country with such great desert areas (see Figures 6.5 and 6.6).

عزيزتي الجزيرة

الخميس ١٤ من ربيع الا

الأشجار تموت واقفة

عزيزتي الجزيرة:

السلام عليكم ورحمة الله وبركاته.. وبعد:

تحت الظروف البيئية والمناخية للمملكة كانخفاض معدلات سقوط الامطار السنوية وارتفاع درجات الحرارة صيفا ومشاكل التصحر وزحف الرمال في بعض المناطق وغيرها من العوامل زادت اهمية الشجرة في بلادنا ومن هنا جاءت فكرة اقامة اسبوع الشجرة سنويا وصدر قرار بذلك في عام ١٣٩٦هـ.. وتم تطبيقه اعتبارا من عام ١٣٩٨هـ اي منذ ما يزيد عن عشرين عاما.

ولسنا هنا بصدد الحديث عن هذا الاسبوع والذي يعتبر من اهم الاسابيع التي تقام سنويا نظرا للنتائج الايجابية الملموسة من اقامة هذا الاسبوع ولكننا بصدد الحديث عن اهمية دراسة الامكانيات المادية والبشرية المتاحة لخدمة هذه الشجرة بعد زراعتها وكذلك التنسيق بين الجهات التي تقوم بتنفيذ هذا الاسبوع لاختيار الاماكن المناسبة لغرس الاشجار وخصوصا الاجهزة المسؤولة عن الطرق لان كثيرا من الاشجار المغروسة بشكل عشوائي قد تسبب بعض الحوادث المرورية نتيجة لقربها من مسارات الطريق او حجبها للرؤية والتصور ان دراسة هذه الامكانيات قبل التوسع في غرس الاشجار مهمة جدا من اجل استمرار هذه الاشجار على قيد الحياة لان الاشجار كائنات حية تحتاج للماء والغذاء والخدمة كالانسان بل انها اشد حساسية منه.

ففي مدينة شقراء على سبيل المثال لا الحصر تقوم البلدية بجهود كبيرة لزيادة المساحة الخضراء والاهتمام بالتشجير لكن الملاحظ ان العناية والخدمة تقتصر على الدوارين والشوارع الرئيسية كمداخل المدينة اما

Figure 6.5. An article in the public newspaper entitled 'The Tree Died Standing' showing the need to protect the green zones and trees within urban areas, and how this is important in such a desert environment.
Source: Al-Jazeera newspaper, 1998.

كل القطاعات مسئولة عن المحافظة على البيئة والمطلوب

البيئة منكم واليكم

د. ابراهيم محمد عارف *

■ تعتبر المملكة العربية السعودية
لدول التي أولت جانب المحافظة
البيئة اهتماماً كبيراً وذلك انطلاقاً
درصها على مبدأ التوازن البيئي
لامة المواطن مع مواكبة التقدم
ضاري في المدن والقرى وخلوها
لتلوث الناتج عن مخلفات المصانع
دم السيارات وغيرها. وكذلك
ناطه على أهم الموارد الطبيعية
ل الماء والغطاء النباتي والتربة
روة الحيوانية) وصيانتها من
هور وازالة جميع العوائق التي
عليها وشرعت الجهات المسئولة
العديد من الندوات عن البيئة.
هذا الاهتمام في وقت مهم حيث
ي اليوم معظم دول العالم من
ت البيئي.
يعتبر الحفاظ على الغطاء النباتي
أ من أهم الاهتمامات البيئية في
م وذلك لأهمية الغطاء النباتي في
اية البيئية فهو مصدر غناء
وكساء ومصدر الكسجين وتمتص
الاشجار الاتربة العالقة والغازات
السامة الناتجة من المصانع وحركة
الطائرات والسيارات بالاضافة الى
ابواء لجميع الكائنات البرية وتحفظ
التربة وخاصة الزراعية من الانجراف
خلال مواسم الأمطار وسرعة الرياح.
وانخفاض مستوى تعرية التربة يقلل
من التوهج الاشعاعي وخاصة خلال
فصل الصيف.
واليوم معظم الدراسات والبحوث
تجرى في أعرق الجامعات العالمية
لمعرفة أهم العوامل التي تؤثر على
الغطاء النباتي لايجاد افضل الحلول
لأي ظاهرة جديدة قد تؤثر على حياة
النباتات الطبيعية واستمرارية نموها
في مواقعها الطبيعية ولاسيما في هذا
العصر الذي قد انقرضت اعداد كبيرة
من النباتات والحيوانات والباقي
مهددة بالانقراض في معظم دول
العالم.
لقد
اصبحت البيئة
من أهم
المواضيع التي
يتحدث عنها
الناس على
اختلاف
ثقافتهم في
مدارسهم
ومعاهدهم
وكلياتهم
وايضا في
مجالسهم
والسبب في
ذلك يعود الى
امور عدة منها
ما يطرحه
الاعلام المقروء
والمسموع عن
التلوث البيئي
على الانسان
والطبيعة في جميع بقاع العالم
الشئون البلدية
والقروية
وزارة
المواصلات
وكذلك الجهود
المشكورة التي
تقوم بها
المؤسسات
التعليمية
كالجامعات
ومراكز
البحوث ببرامج
البحوث العلمية
التي تحاول
جاهدة في
ايجاد الحلول
الطرق العلمية
لتنمية الغطاء
النباتي
والحفاظ عليه.
وان كانت
الطبيعية ومحاولة التقليل
الناتجة من المصانع وخاص
النووية.
بينما الوضع يختلف
والتي تواجه مشكلة تخ
يواجهه غيرها من البلدان
المملكة العربية السعودية
الاقاليم الصحراوية وال
بارتفاع درجات الحر
الرمال بسبب الجفاف وس
خلال فصل الخريف وتم
الشتاء بالاضافة الى زي
الصناعي على المدن التا
المصانع، وزيادة الغازات
وزيادة مياه الصرف الص
المعالجة. والعامل المشترك
اثارها هو الغطاء النباتي
فائدة ذكرتها سابقاً.
ونظراً لوجود مؤسسا
تهتم بالبيئة وهدفها المحافظ
فان فكرة انشاء هيئة

Figure 6.6. A newspaper article entitled 'Every Government and Private Sector in the Kingdom of Saudi Arabia is Responsible for the Protection of the Environment', showing the need for co-operation among the government agencies to protect the environment.
Source: Al-Riyadh newspaper, 1998.

Environmental preservation is also high on the public agenda in the United Kingdom (see Figure 6.7):

> England's green and pleasant land could disappear under a sea of concrete in 20 years if current rates of housebuilding continue, environmentalists warned. (Daily Mail, 11/12/97, p. 31)

Figure 6.7. The importance of the issues indicated by a UK newspaper.
Source: Daily Mail, 11 December, 1997.

6.9 Urban Growth Boundary and National Spacial Strategy (NSS).

Most Saudi cities experienced a period of hitherto unknown growth and physical expansion following the 1973 oil boom, an expansion which took in illegal settlements and land acquisitions and unco-ordinated residential sprawl. Despite the introduction of plans of various sorts since then – master plans, physical plans, and general plans – this sort of expansion has not been brought fully under control (see Chapter 3).

To deal with the situation the setting up of urban growth boundaries (UGBs) by the Resolution No. 1170 in 1977 for Towns and Cities was issued by the Council of Ministers, intended to cover the next 20 years. UGB was to be in three stages, and these were to be consistent with the National Five Year Development Plans. MOMRA therefore instructed municipalities to get ready detailed studies of existing developments and put them on the master plan maps. And in 1979 MOMRA asked municipal authorities to call a halt to the approval of land subdivision outside the master plan area and to seek the approval of the DMTP in any cases where they thought it was necessary. They also asked municipalities to submit their UGB reports to the DMTP.

Resolution No. 13 was issued by the Council of Ministers in 1986, which called a halt to the approval of all land subdivisions throughout the country for a period of two years. In the course of these two years MOMRA completed its UGB study for towns and cities (100) and passed it for approval to the Council of Ministers. The Council also asked MOMRA to prepare the conditions for land subdivision approval both inside and outside UGB. The UGB of 100 towns and cities was approved in 1989 by the Council of Ministers, an approval which should take care of matters, in two phases, until the year 2005. In addition to a protection zone the phases of the UGB are:

First Phase

Land covered by this first phase of UGB will be liable to subdivision without the consent of the owner provided that land to be used for roads and municipal services does not exceed 33% of total subdivided land.

Second Phase

Land within this phase is not to be subdivided before the enforcement date of this phase (with the exception of main roads, which may be constructed without the owner's request as long as the 33% of total land used as mentioned in the preceding paragraph is not exceeded). Conditional land subdivision may take place thus:

A. *Amanat* and class A municipalities except Hafr Al-Batin: An owner willing to allow subdivision of his land shall be responsible for the installation of water, electricity, and telephones to all plots according to the approved subdivision plan. He is also responsible for the asphalting, upgrading, and lighting of streets according to the approved specifications.

B. Class B and C municipalities and Hafr Al-Batin: An owner willing to allow his land to be subdivided is to be responsible for the installation of water and electricity, as well as the asphalting of streets according to the preliminary subdivision plan and after getting the appropriate approval.

C. For private land outside the UGB but within the protection zone, Clause 2, Paragraph (b) of the Council of Ministers Resolution No. 175 (1989) will apply. This prohibits development and subdivision of white land between the urban boundary and the urban protection zone until MOMRA proposes the methods and controls required to deal with this land (Zahid, 1996; Abdulaal and Al-Rahman, 1997).

6.9.1 The Main Goals and Contents of UGB

- Controlling urban growth, especially random growth.
- Checking urban sprawl.
- Rationalising infrastructure use and operation.

When we consider the main objectives of UGB, it is easy to comprehend that no great regard was given to the protection of the natural environment as a whole or to the oases in particular. But there was special consideration given to the preservation of agricultural land within or beside existing urban areas. Stringent development controls were applied only to economically productive agricultural land. Non-productive allotments were excluded from the controls and may be allowed to change their use by the DMTP and the Ministry of Agriculture and Water. This policy of strict control only over land in or adjacent to existing built-up areas will have a negative effect, however, on oasis areas. Most oases settlements in the Kingdom consist just of such built-up land surrounded by viable agricultural land (or including some viable agricultural land). This will mean more pressure to build on this agricultural land, so that it will be lost forever, and it provides an incentive and an opportunity for some who had decided to let their land to die to change their mind and put it to more commercially profitable use. However, agricultural and water policies discourage excessive utilisation of areas with potentially serious problems, such as non-renewable groundwater sources, while implementing the UGB encourages developing areas with good soil and plenty of water.

6.9.2 The Urban Growth Boundary Process

The UGB process is straightforward. It consists of:

1. The preparation of maps.
2. A field survey dealing with urban structure and services.
3. Analysis of urban structure and services, population growth, and infrastructure.
4. Based on the analysis of population growth, the requirement for the provision for urban activities, the provision of services, the cost of urban growth, and the relationship to National Plan policies, a demarcation of UGB as applicable to the area concerned is drawn up.

Zahid (1996) and Abdulaal and Al-Rahman (1997) hold the view that, while delineation seems simple, UGB is not in fact an easy business. Problems may arise, for example, in defining the best area for development. The cities of Madinah and Taif, for example, include mountainous areas and flood areas, which cannot be developed. And any uncertainty in predicting the rate of urban growth makes it hard

to demarcate the area that will be required for development. Large-scale co-operation between MOMRA and the municipal authorities of the cities concerned is required.

The UGB process clearly makes no special allowance for a consideration of environmental concerns. On one occasion the researcher asked an official in the Department of Planning in Dammam whether there was a concern for green areas and agricultural land within the cities or the settlements or the region. His answer was Yes, there was such concern, and the UGB differs from city to city and between rural areas and urban areas. In theory, perhaps, the government objectives provide means of curbing urban growth, but in practice no specific provisions have been made about the control of the speed, nature, and direction of growth and its impact. Abdulaal and Al-Rahman (1997) support this view:

> There are no provisions particularly on the rate, amount, type and quality of growth, land acquisition and environmental control . . . Generally speaking the provisions are inadequate and require additional stipulations. (p. 150)

The UGB was evidently not seen as a step to preserve agricultural land as no particular mention was made of safeguarding the oases in relation to agricultural land. Oasis settlements, it seems, were to be treated as any other settled areas as far as land development was concerned, and no special arrangements were made for them.

In the other hand the National Spatial Strategy was approved in 28/8 /2000; by the resolution NO. 127 the objectives of these document are :

1. Appropriate utilisation of existing infrastructures and services.
2. Directing the development in the urban, social and economical sectors out of the rapid growth regions and urban centres, which can then achieve balanced development.
3. Exploitation of the economic expansion regions and enhancing this development for the different regions which can achieve the Kingdom's long-term sustainability.
4. Identifying the growth centres which aim to achieve a balanced urban development.
5. Achieving comprehensive development of the rural and urban areas.

The strategy proposes that Al-Qatif, which is located in the existing development corridor between Al-Jubail and Al-Hofuf, should be a growth centre to reduce urban encroachment towards the coast and increase the co-ordination between different activities and regions located in this corridor.

This means the likelihood of even more future development in the oasis and more urban development pressure.

In terms of environment protection the strategy proposes the following:

1. Taking the environment into consideration in all the development activities.
2. Providing legislation to protect the environment from the impact of urban and industrial development.
3. Taking particular action to protect agricultural soil by ring-fencing small agricultural areas.
4. Protecting forest resources and expanding planting activity.

In general the strategy has well organised objectives in term of physical, social, and economical activities. However it seems in general likely to attract development pressure to Al-Qatif, which may increase urban encroachment on the oasis. On the other hand the strategy proposes some environmental actions which, if they are implemented in the future, will benefit the natural resources in the oasis.

So it is plain through the analysis offered in this chapter that existing policies relating to land development and control, such as local plans, UGB, zoning, building regulations, and so on, are still too general and unspecific. The policies need to be updated and rewritten in some areas, especially as they relate, or ought to relate, to the protection of the environment and in particular the oases. Environmental assessment should be applied at the plan preparation stage and integration with the policies and programmes of other national ministries and agencies is required. It is this lack of policy integration and of environmentally sustainable land development policies that have made worse the environmental problems in cities and other urban areas. This has been accepted by the Deputy Minister of Municipal and Rural Affairs. In October

1998, at the opening of the conference in Riyadh to discuss and introduce national building regulations he said:

> Because of the rapid urban growth and the features of past planning activities as they have affected economic and social factors, providing the right planning policies in general and building regulations in particular are difficult matters. As a result, building regulations in all of the Kingdom's cities are the same, which does not take into consideration the different social, economic, environment and topographical factors for each city.

He added that the discussions taking place will cover a very important issue, which is the loss of agricultural land as a result of urban growth, and will attempt to find the paths to sustainable development, which was one of the Kingdom's main goals. This indicates how important this research is in its efforts to find ways to solve the very serious problems affecting the environment in general and the oases in particular.

شؤون محلية

الاحد ١٤ من جمادى الآخرة ١٤١٩هـ ٤ من اكتوبر - تشرين الاول - ١٩٩٨م. العدد ٩٥٠٢

الجزيرة

day4/109/1998G. No 9502

وكيل وزارة الشئون البلدية المساعد للتخطيط العمراني يتحدث لـ (الجزيرة):

مناقشة وضع استراتيجية وطنية شاملة لأنظمة البناء والعمران في المملكة

٢٠٠ مشارك ومختص سيبحثون هذه الاستراتيجية اعتباراً من اليوم

□ المرحلة الراهنة تتطلب التجديد.. وهذه جوانب الخلل في أنظمة البناء القائمة

□ د. عبدالعزيز الخضير □

□ د. الخضير يتحدث للزميل القحطاني عن تركيبات البناء والاعمار □

□ أجرى الحديث:
عوض مانع القحطاني

Figure 6.8. An article about the discussion and introduction of national building regulations in Saudi Arabia. Some of the issues discussed are the loss of agricultural land as a result of urban growth, and attempts to find ways to sustainable development.
Source: Al-Jazeera newspaper, No. 5202, 4 October, 1998.

6.10 Summary

MOMRA has been discussed in the first part of this chapter as the most important ministry in the matter of land development and land development control in the Kingdom of Saudi Arabia. We have seen how MOMRA has its stated policies enshrined in the National Development Plans and have noted the initiatives it has taken in matters relating to environmental improvement, and land and natural resource preservation for the generations of the future. MOMRA, however, has been shown to place a higher priority on the provision of a social and physical infrastructure, and on approving the location of such developments according to the MOMRA policies and guidelines. MOMRA has been less concerned with co-operation with other agencies as far as sustainable development of the environment is concerned.

The second part of the chapter has been concerned with the nature of land tenure and ownership in Saudi Arabia. It also outlines the process of urban development from the initial provision of the land right up to the construction of buildings on it, and shows that there are now signs of awareness that environmental assessment must be made of any proposed or actual urban developments. There is now an acknowledgement that the environmental impact of buildings, roads, the provision of services and utilities is something that has to be taken into consideration.

The third part of this chapter discusses the processes and policies involved in the preparation and application of local plans (master plans) and the urban growth boundary as a tool to control land development. According to the policies laid down local plans were assigned to the cities – first the major cities and then others. Moreover the process through which the plan goes, from conception to implementation, shows the lack of policies which recommend that there should be participation by the ministries whose remits cover environmental issues, such as MCE, MEPA, and NCWCD.

However, investigation shows that one of the objectives for MOMRA as set out in the Fifth National Development Plan was to preserve land, natural resources, and the environment and use them for the benefit of future citizens. The government, then,

has clearly put forward the development policies and objectives in each sector. What has been provided, though, is broad and generalised and does not focus enough on specific issues, such as the matters affecting the oases.

The third part of the chapter also highlights the lack of environmental assessment and concentration. The aim had been to be consistent with the National Development Plans. However, in practice the process has not proved capable of concentrating on the importance of environmental assessment as set out in the fifth and sixth plans.

The concepts of sustainable development and SEA as a tool to achieve it have been discussed in Chapter Two, as have Islamic values and principles relating to the environment in Saudi Arabia. Chapter Three has discussed the importance of the oases in Saudi Arabia, urbanisation and development and their impact, and the urban and regional planning processes. National Development Plans have been discussed in Chapter Four. Environmental policies and documents, and water and agricultural policies in the Kingdom have been treated in Chapter Five, and Chapter Six has handled local plans (master plans) and urban growth boundary (UGB) and (NSS) as a tool of the control of land development.

This research has as its aim to start with the analysis and review of other policies in order to comprehend firstly the impact of these policies and strategies on the environment in general, and secondly the impact on oases in Saudi Arabia in particular.

The analysis and review of the policies has revealed that there are very many policies in each sector we have examined, but they suffer from lack of comprehensive integration with each other. Policies are often incompatible and conflict with each other for success and they lack a comprehensive implementation at the local level. This has had a negative impact on the environment in general and the especially on the oases.

As we have seen in Chapters Three, Four, Five, and Six, the government has introduced appropriate policies and strategies for development and for the protection

of the environment. But the effect of these has been mixed – positive in some ways but also more negative than anticipated. On the positive side there has been considerable development and improvement in urban areas and there has been the setting up of appropriate ministries and agencies to oversee and implement the government's policies. On the negative side we have seen the less attractive results of the developments, such as noise, air pollution, and land pollution, as discussed in Chapters Three, Four, and Five. A particular negative aspect, of concern to this study, has been the loss of agricultural land in oasis areas.

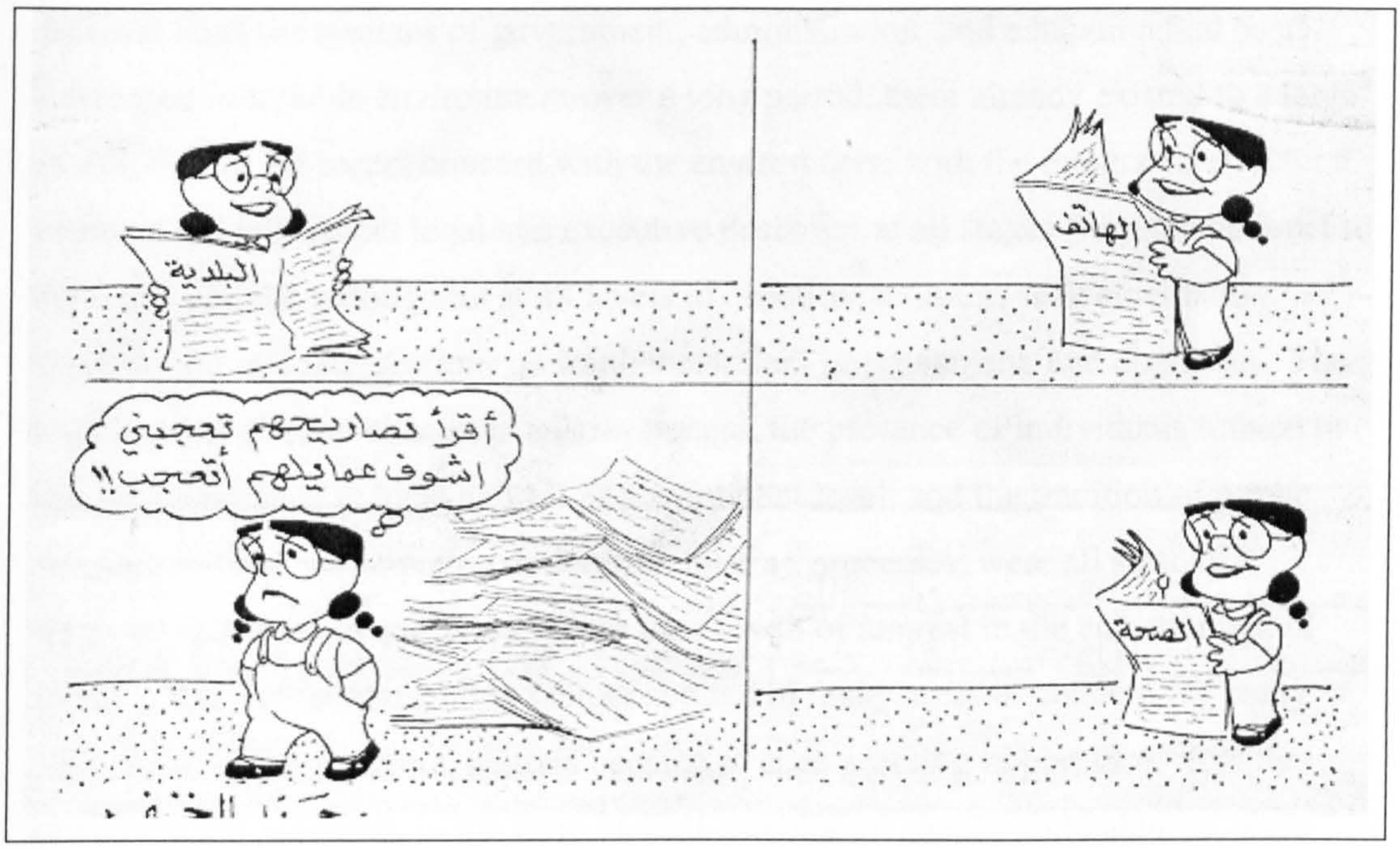


Figure 6.9. A cartoon published in AL-JAZZEERA newspaper in 17/9/1998(no.9485) shows the lack of integration between the government authorities and sectors that are involved in the developments. It is common to read various statements which are revealed by the authorities of those sectors about their existing and future plans, but in the reality it is not true, as none of their plans are comprehensively achieved !!!
Source: Al-Jazeera newspaper, No. 9485, 17 September 1998.

Chapter Two has shown the importance of SEA and of planning as tools leading to the achievement of sustainable development. We have also seen from that chapter that there are specific factors that, when present, can facilitate the workability of SEA and related tools in reaching this goal. Thus, in developed countries, assessment and planning can be utilised more effectively than in some other countries in the realisation of their objective. The critical areas of development for the successful

operation of SEA appear to be the extent to which the state concerned is 'advanced', both in terms of political and social structures, and in terms of education, and is characterised by knowledge, formulation, implementation, responsiveness, and reviewing of activities linked to development.

This, as it were, 'constitutional' receptiveness typical of some countries is a matter of two factors: one is existing structures and practices, and the other is readiness to introduce new measures specifically designed to facilitate assessment and planning tools. Thus, for example, in a country such as the UK, where at both local and national level the systems of government, administration, and education had been developed in a stable environment over a long period, there already existed to a large extent, before the recent concern with the environment, both the integrated structural apparatus to implement legal and executive decisions at all stages from the national to the local, and the willingness at all levels to question, monitor, seek elucidation, discuss, and offer suggestions on implementation, improvement, and operation. The high level of general education and awareness, the presence of individuals trained in the area concerned at local as well as government level, and the tradition of public consultation and participation in decision making processes, were all structural elements that were in operation before the growth of interest in the environment of recent years. These integrating factors applied in many areas of concern for many years before environmental matters became of such pressing importance. Existing structures and practices, in the form of well-established checks and balances, were therefore already in place to help facilitate the role of SEA and planning in leading to sustainable development.

Furthermore in developed countries, and of course related to the political, social, and education structures described above, there has also been a willingness to introduce specific measures in relation to environmental policies, plans, and programmes (PPPs) in order to make them more workable. This has taken the form both of spelling out specifically how a national policy might be realised at a lower (regional or local) level, and of putting in place the mechanism both to implement it and to monitor it. A commitment to SEA, then, has been more than just an acceptance of internationally recognised requirements and agreements, but a conscious effort to put it into practice

at all stages. Constant review has taken place not only, through the assessment tools, of projects planned or undertaken, but also of the assessment and planning tools themselves.

Thus, as we have noted in Chapter Two, in the UK, a number of guidance papers and pamphlets have been published to aid authorities in carrying out assessment measures in order to achieve the conscious goal of sustainable development. Of particular importance among these publications are the Department of the Environment pamphlets Policy Appraisal and the Environment (1991), Planning Policy Guidance Note (PPG 12) (1992), and the Environmental Appraisal of Development Plans (1993), to guide local authorities in preparing their plans in a sustainable way.

Policy Appraisal and the Environment displays a broad approach and sets out in general terms the stages of EA. Planning Policy Guidance Note (PPG 12) (DoE, 1992), is primarily intended to provide guidance at local level on policies and planning leading to sustainable development, and in particular it provides detailed guidance on the environmental appraisal of plan proposals.

The Environmental Appraisal of Development Plans deals with the objectives and procedures associated with EA. It is a detailed document and is intended to be adaptable to every level of plan, so that PPPs and the way they are implemented, assessed, and reviewed may be given specific 'cash value' even at local level. As a result several UK local authorities have responded by producing their own environmental appraisal of their development plans, using the guidelines which have been produced by the government. Chapter Two gives examples of such initiatives.

We can thus see how these published guidelines and other enabling measures have meant that developed countries are characterised by a comprehensive and integrated approach to sustainable development and the assessment techniques and related tools intended to lead to sustainable development. SEA and land use planning are workable because they are integrated with PPPs relating both to the environment and other concerns, and because there exist at all levels the knowledge and willingness to provide input into the entire process.

The situation in Saudi Arabia is rather different, however, as we have seen, particularly in the discussion of policies in this present chapter and in Chapter Five. The situation is characterised by a lack of comprehensive integration, a prime example of this having been the setting up of UGBs, discussed in Chapter Six. It is clear that there is no special provision for environmental concerns in the UGB process, and in fact the implementation of UGB, with the emphasis on the safeguarding of agricultural land, has had a detrimental effect on the Kingdom's oasis resources.

Saudi Arabia is also characterised by the lack of providing guidance at a local level on how PPPs drawn up at a higher level may be implemented locally. Indeed Abdulaal and Al-Rahman (1997) have pointed out that while the law lays down that (local) master plans should be approved by the relevant authorities, it does not set out the title, nature, area, and scope of local plans or their method of preparation. This lack of control has, not surprisingly, had a negative impact on the environment in general and on the Kingdom's oases in particular.

MOMRA, as we have noted, has stated that planning for urban development, whether at national or local level, should be in collaboration with other bodies. However, it is clear that an admirable statement of the need for integration is not sufficient, and there is a lack of stress on EIA or SEA or on guidelines for their implementation in MOMRA's programmes or provision of services. As an example, we can see from our review of the processes of land provision, land improvement, and construction that there are no clear policies or requirements to submit any studies related to the environmental impact of what is done in these spheres. There is no application of EIA or SEA,. The chain from national acceptance of and encouragement of environmentally sound policies to their recognition and application at local level is broken, and the goal of sustainable development is thereby endangered.

The result is that, although the goodwill and commitment of the government, and indeed of municipalities, to sustainable development and to the planning and assessment tools needed to achieve it need not be doubted, the means to achieve it are still not fully in place. Thus, the environment suffers.

The next chapter of this thesis will set out the background to the Al-Qatif oasis as a case study. It will be described in physical, socio-economic, and historical terms, and an account will be given for the reasons for its selection as an illustration of the environmental and development themes of this thesis.

In this case study the material uncovered and set out in the previous chapters will be used to assess the current situation in the oasis. The objective of the case study will be to collect empirical data to support the hypothesis expressed in the previous chapters, i.e. they are general policies in relation to the environmental issues (protection of the agricultural land of the oasis) and not comprehensive, and furthermore they are contradictory and seem to be not well understood and implemented at the local level. This has resulted in some general environmental problems discussed in the previous chapter and major problems related to the loss of the agricultural land of the oasis.

Chapter 7

Al-Qatif Oasis

7.5 The Socio-Economic Situation

7.5.1 Population

7.5.2 Population Studies

7.6 Historical Development of the Al-Qatif Oasis

7.6.1 Coastal Settlement

7.6.2 Agricultural Settlements

7.6.3 Desert Settlements

7.6.4 Al-Qatif features

7.7 General Land Use

7.7.1 Employment

7.7.2 Building Conditions

7.7.3 Building Height

7.7.4 Public Services

7.7.4.1 Municipal Services

7.7.4.2 Education Services

7.7.4.3 Health Services

7.7.4.4 Sport and Leisure Services

7.7.4.5 Social Services

7.7.4.6 Commercial and Recreational Areas

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7.9.2.1 The Main Goals of the UGB

7.10 Summary

CHAPTER 7 Al-Qatif Oasis

7.1 Introduction

A very important, but so far neglected, question in physical planning and development is that of a suitable development strategy for the numerous oases in the Kingdom of Saudi Arabia. This might not have been a problem in the old days but currently it is a very serious development and environmental issue, which needs to be addressed. There are many oases located in different parts of the country, such as Al-Kharj oasis, Al-Madinah oasis, Al-Hassa oasis, Al-Qatif oasis, and Al-AQasim oasis, as shown in Figure 7.1..

These old oases are historically important as they are considered to have been the focus of early development in Saudi Arabia and thus the seed-bed of civilisation in the Kingdom. They are a very considerable source of crops and other agricultural products. Some of the oases, such as Al-Hassa and Al-Qatif, are the locations of a large number of settlements, whereas others, such as Al-Kharj and Al-Madinah, have only a few settlements.(Al-Arfaj, 1994, Al-Oqail, 1994).

7.2 Why Al-Qatif Oasis?

As previously stated, Al-Qatif oasis is the second largest in the country, it is near to the home of the researcher, who used to visit it for recreational purposes, and its situation makes it easy to reach and to study. It is located on the coast of the Eastern Province, an area where oil was discovered, and where huge development has taken place. Al-Qatif oasis is situated between two big cities, Dammam and Jubail, which have an effect on the oasis as well as the coastal area, and, although in a desert region, it is surrounded by agricultural land. Indeed the oasis is the agricultural centre of the eastern part of the country. Al-Qatif's location on the Arabian Gulf makes it relatively easily accessible from other Gulf countries and the transport infrastructure of Saudi Arabia means that it is also accessible to many other parts of the Kingdom.

Oases In The Kingdom Of Saudia Arabia	Figure:7.1
	N SCALE 1:15.000.000

JORDAN

IRAQ

IRAN

ARABIAN GULF

U.A.E.

OMAN

RED SEA

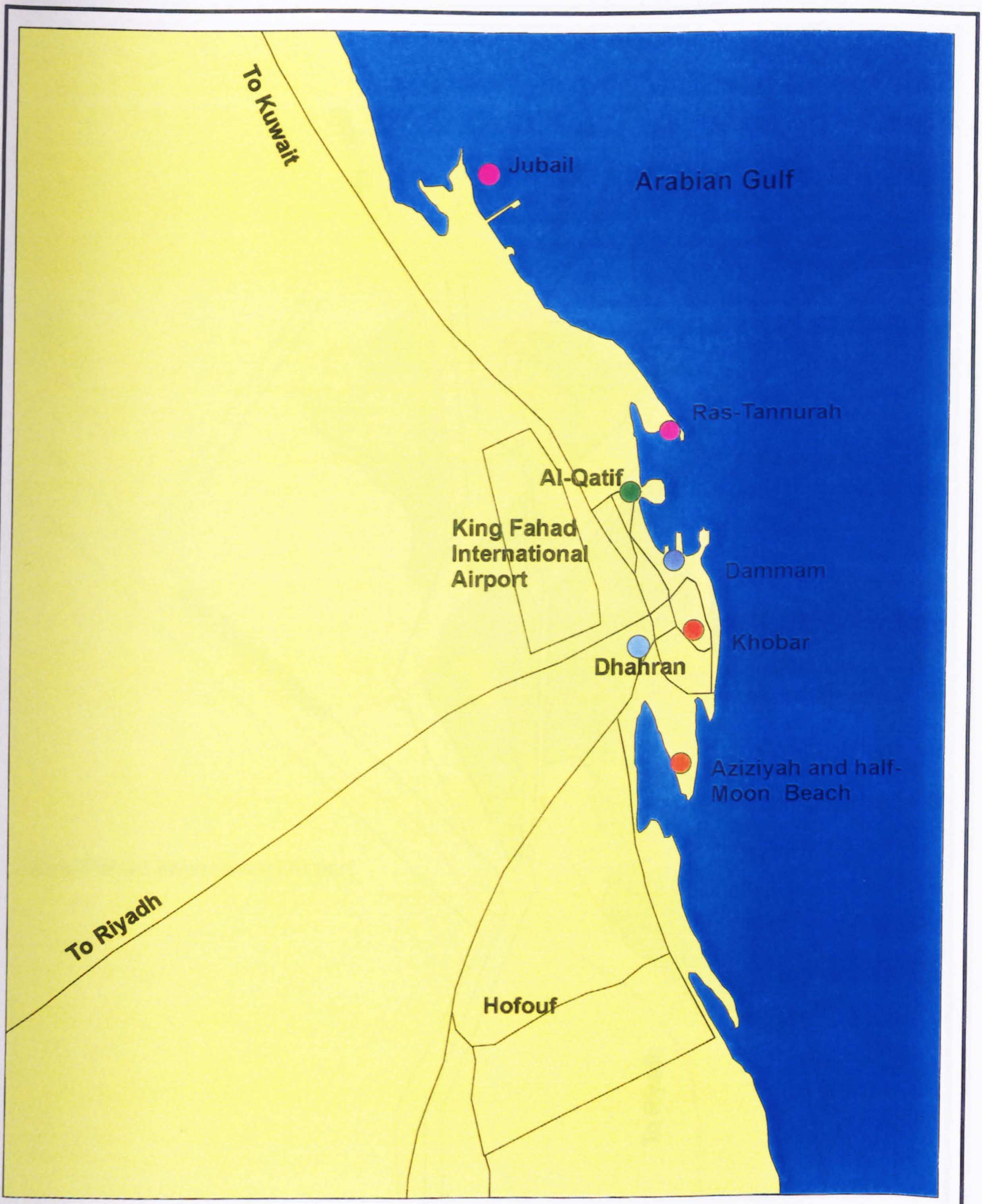
KINGDOM OF SAUDI ARABIA

YEMEN

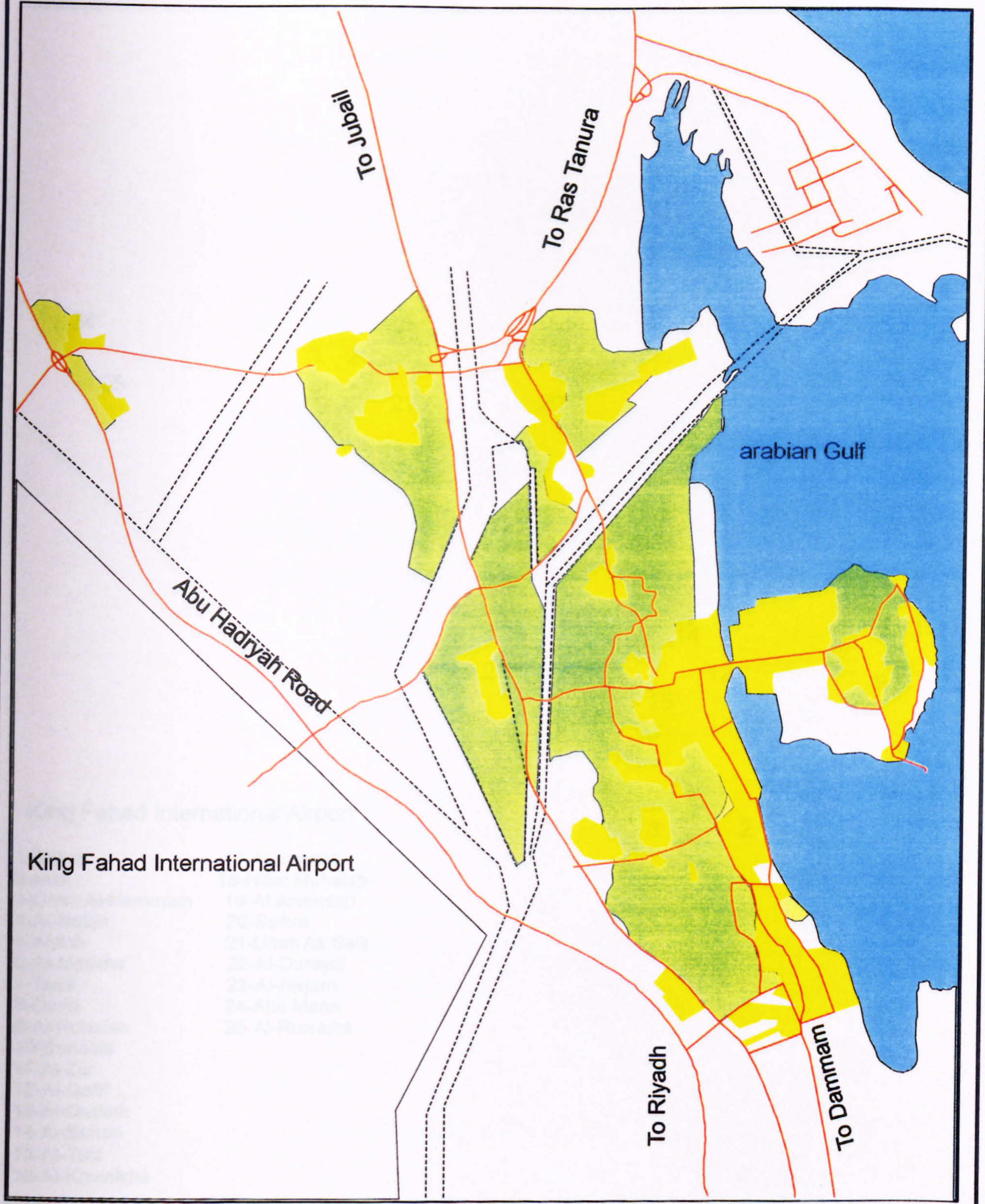
SOUDAN

ARABIAN SEA

Al-Qatif Oasis in the National Context	Figure:7.2
● study area location --- International boundary	N
.... local boundary ▭ Eastern province	SCALE 1:15.000.000



Al-Qatif Oasis In The Regional Context	Figure: 7.3)
Administration · Scientific · Agriculture Commerce · Recreational · Industrial	N SCALE 1:3.000.000



Existing land Uses

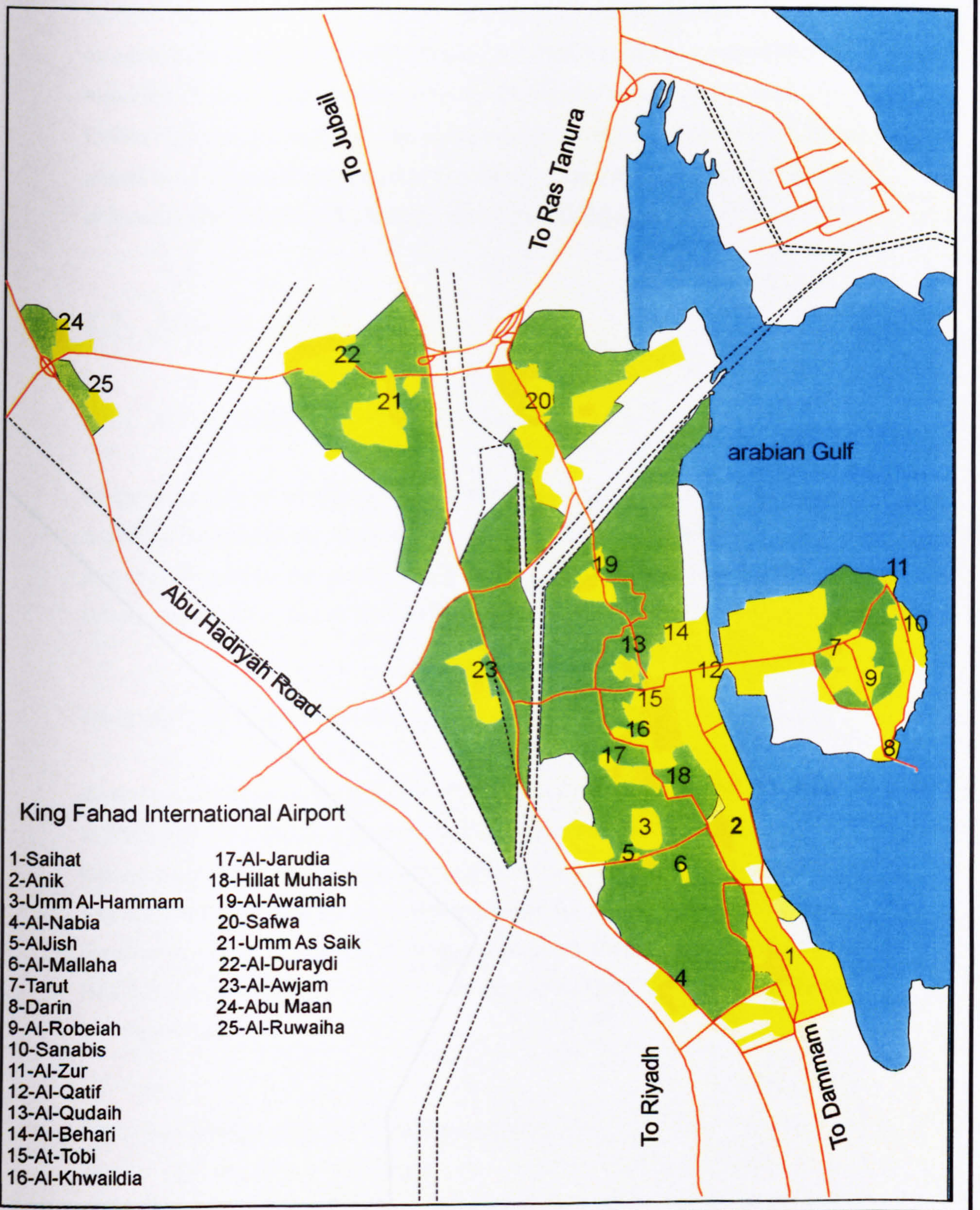
Figure: 7.4)

Urban Areas **Agriculture** **Roads**

::: ARAMCO Reserved

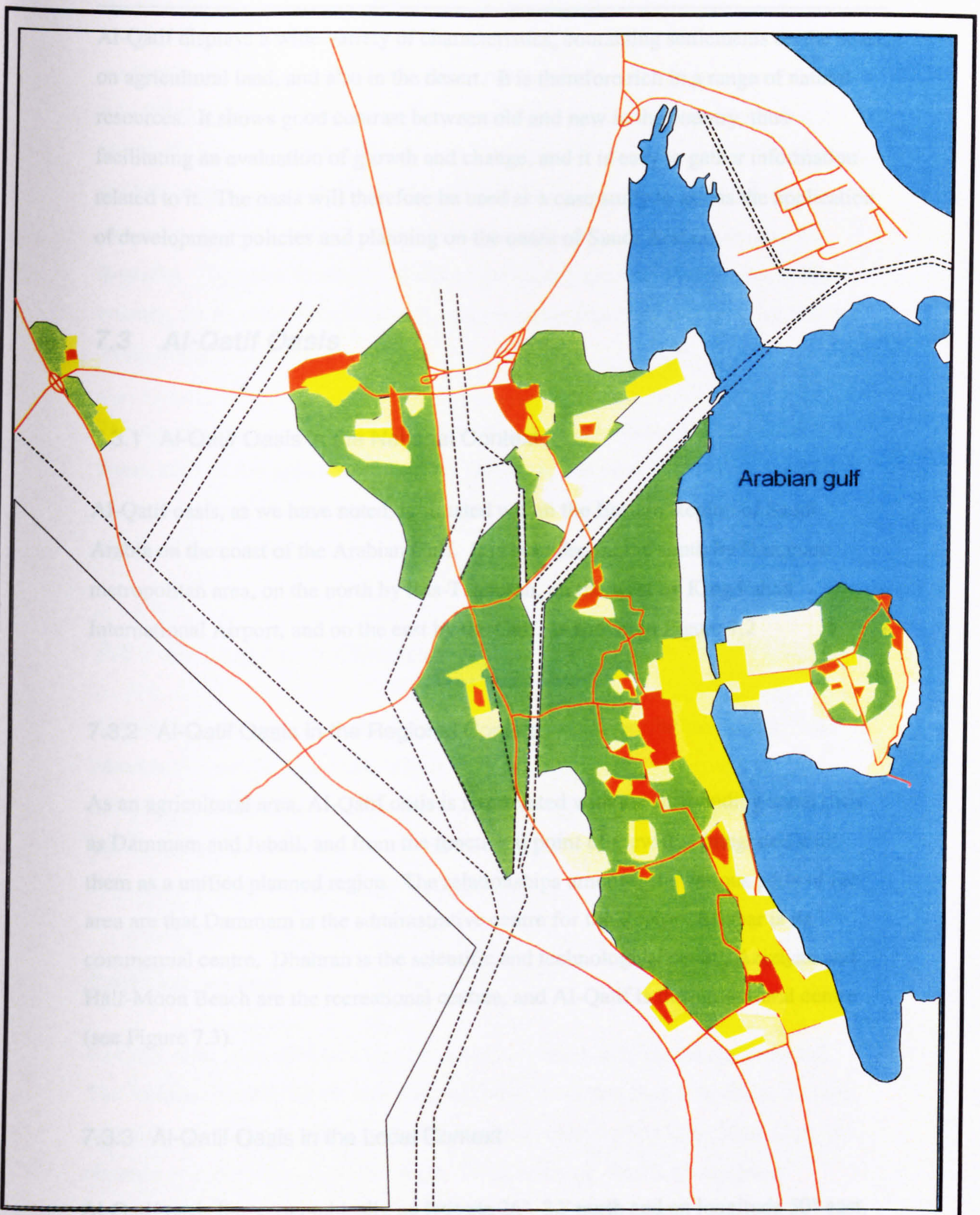
N

SCALE 1:150,000



Al-Qatif Oasis and its Settlements

Figure: 7.5



URBAN GROWTH OF THE QATIF OASIS

FIGURE: 7.6)

UPTO-1965 **1966-1975** **1976-1985** **1986-1995** **AGRICULTURE**

N

SCALE 1:150,000

Al-Qatif displays a wide variety of characteristics, containing settlements on the coast, on agricultural land, and also in the desert. It is therefore rich in a range of natural resources. It shows good contrast between old and new in the country, thus facilitating an evaluation of growth and change, and it is easy to gather information related to it. The oasis will therefore be used as a case study to assess the application of development policies and planning on the oases of Saudi Arabia.

7.3 Al-Qatif Oasis

7.3.1 Al-Qatif Oasis in the National Context

Al-Qatif oasis, as we have noted, is situated within the Eastern Region of Saudi Arabia on the coast of the Arabian Gulf. It is bounded on the south by Dammam metropolitan area, on the north by Ras-Tannurah, on the west by King Fahad International Airport, and on the east by the Gulf, as shown in Figure 7.2

7.3.2 Al-Qatif Oasis in the Regional Context

As an agricultural area, Al-Qatif oasis is interrelated with the surrounding areas such as Dammam and Jubail, and from the functional point of view it is integrated with them as a unified planned region. The relationships amongst the various parts of the area are that Dammam is the administrative centre for the Region, Khobar is its commercial centre, Dhahran is the scientific and technological centre, Aziziyah and Half-Moon Beach are the recreational centres, and Al-Qatif is the agricultural centre (see Figure 7.3).

7.3.3 Al-Qatif Oasis in the Local Context

Al-Qatif oasis lies geographically on latitude 26° 32' north and on longitude 50° east, with a total area of 400 sq. km., 20 km. north of Dammam city. To the north its extension takes in the villages of Safwa, Abu Maan, and Umm Al-Saleh, and the land to its south is a natural extension of the city of Dammam (see Figures 7.4 and 7.5).

Al-Qatif oasis consists of 25 settlements, urban centres and villages clusters(defined by MOMRA 1988), These settlements are: Saihat, Anak, Umm Al-Hammam, Al-Nabia, Al-Jish, Al-Mallaha, Tarut, Darin, Al-Robeiah, Sanabis, Al-Zur, Al-Qatif, Al-Qudaih, Al-Behari, At-Tobi, Al-Khwaildiah, Al-Jarudia, Hillat Muhaish, Al-Awamiah, Safwa, Umm As Sahik, Al-Duraydi, Al-Awjam, Abu Maan, and Al-Ruwaiha. The oasis is considered one of the most important, historically, in the country, for its natural resources, oil, and various agricultural products (MOMRA, 1988; MOMRA, 1991).

These various settlements are of different sizes and they do not all take the same form. Some, such as Al-Qudaih and Umm Al-Hammam, are surrounded on all sides by agricultural land, whereas others have agricultural land on just two or three sides (see Figures 7.4 and 4.5).

7.4 Geology and Climate

Al-Qatif oasis extends from Ras Tanura to Dammam on the Gulf coat, with Tarut island in the middle. The oasis is lush, with dense trees which surround the settlements. The soil is sandy in general, with an upper sand stratum covering a porous aquifer rich in water, which can be extracted by wells. Oil exists, with the rock strata traps at depths of 1,500 to 2,700 m.

7.4.1 Topography

Al-Qatif oasis is situated on a low-lying coastal plain bordering the Arabian Gulf. The surface elevation on the long irregular coastline is less than 3 m. above average high tide and the terrain rises gradually to an elevation ranging from 10 to 12 m. at a distance of approximately 4 km. inland. Rock outcrops, which are scattered throughout the oasis, form the only relief in the generally flat land. These outcrops are typically just 1 or 2 m. higher than the surrounding area, and serve as the bases on which some of the villages have developed.

7.4.2 Soil

The eastern region of the Kingdom is geologically stable in general, with no historical record of earthquakes. ·The soil is composed of alomi stone covered with layers of sand mud, silt, and garin, which are classified in general as neogein layers.

7.4.3 Hydrology

Ground water is found 1 – 2 m. deep. The abundance of ground water is attributed to the plethora of artesian wells dug randomly, in such a way that water has risen in the deep aquifers upward to the surface of the ground.

7.4.4 Climate

In general terms the climate of the Eastern Region is as harsh as it is in the Arabian peninsula as a whole. The Gulf adds to the problem by causing high humidity in the Region. In the areas nearer the Gulf shore, however, coastal winds moderate the climate.

7.4.5 Temperature

The average temperatures in the region rise from about 25° at the beginning of the summer in May to around 42° in July and August. In winter the temperature goes down to reach a low of 7° in January and February.

7.4.6 Rainfall

The rainfall in this region is both little and irregular, with the summer season (June – October) being virtually rainless.

7.4.7 Humidity

Due to the location of the Al-Qatif oasis region on the Arabian Gulf humidity is remarkably high, particularly during the summer. when it varies between 90% maximum and 40% minimum.

7.4.8 Prevailing Winds

The prevailing wind in the Eastern Region is north to north-west, with a velocity of 1 –2 knots. Dusty winds blow towards the end of spring and the beginning of summer causing problems in the major cities.

7.4.9 Vegetation

The Eastern Province of Saudi Arabia lies within the North African - Indian desert floristic zone and the plant life of regions within this zone is quite uniform. Most of the plants are small annual herbs or small shrubs, while trees are rare and there are no forests. Only in oasis areas do the conditions allow for the growth of bush plants, so that these areas therefore became the centres of civilisation and development. Al-Qatif oasis contains many kinds of plants, which can be classified into two types: naturally occurring plants (as described above), and plantations. These latter are mainly accounted for by date palms and other fruits and vegetables. There is also, along the shores of the Gulf, a sea plant called 'alshura', which is protected and preserved for the cultivation of fish and shrimps (MOMRA, 1976; MOMRA, 1988).

7.5 The Socio-Economic Situation

7.5.1 Population

According to the master plan of Al-Qatif drawn up by the consultant G. Candilis in 1976 the population of Al-Qatif city in Al-Qatif Oasis was expected to increase from about 25,700 in 1975 to about 32,000 in 1980, and 92,000 in 1995. However, a 10% sample survey carried out by the Physical Planning Department of Dammam

municipality at each one of the 25 settlements in the oasis in 1987 showed that the total population was 270,110 inhabitants. Also, according to the projections made by the same Department the 1993 population of Al-Qatif oasis was estimated at 313,780, assuming an average annual growth of 3.75% as shown in Table 7.1. The table shows the population of the Al-Qatif oasis settlement in 1993 according to the national census carried out that year. According to a census carried out by the Dammam municipality in 1997 the population of Al-Qatif oasis had reached 420,840.

7.6 Historical Development of the Al-Qatif Oasis

Before the discovery of oil in the Kingdom of Saudi Arabia the Al-Qatif oasis was very important. Historians indicate that settlement in this area goes back to the Copper Age, about 3500 BC. The Greek historians called the place 'Sakha' and stated that its circumference measured about 5 miles. They also mentioned that the region was an important trade centre and had gained a considerable reputation as a market location in Arab lands. A town known as El-Zara was the capital of this region, and the town was well known both in pre-Islamic times and during the early part of the Islamic era. The El-Zara of ancient times, however, no longer exists and nothing is left except the name, which is today applied to a small village near Al-Awamiah. (Al-Arfaj, 1994).

There is no doubt that physical factors determine a settlement's location, growth pattern, and characteristics. The most outstanding natural features in the Al-Qatif region are the sea, which has determined the location of the nucleus of the oasis (see Figure 7.6)

The nucleus of the oasis settlement started in the form of a castle located between the sea and date farms. Bedouins created the northern side of the castle as a main location to pass the time when this area became a secure habitation and later the tribes began to expand their area of settlement beyond the castle fortifications. A market and some dwelling houses were built on the southern side, with narrow roads leading to the oasis.

Subsequent urban development took place in a circular pattern round the castle. With the increasing demand for more habitable land, attention was diverted to the agricultural areas and plateau areas by filling them along the sea shore. This urban

		1987	1991	1993*
1	Saihat	30028	43793	58060
2	Anak	8917	10332	17291
3	Umm Al-Hammam	10935	12870	13433
4	Al-Nabia	3955	4583	
5	Al-Jish	5593	6481	9137
6	Al-Mallaha	2555	2980	3763
7	Tarut	13529	15676	38055
8	Darin	4324	5010	4971
9	Al-Robeiah	6163	7901	
10	Sanabis	11463	13282	
11	Al-Zur	600	692	
12	Al-Qatif	59480	69498	98920
13	Al-Qudaih	28362	32885	23578
14	Al-Behari	3200	3708	
15	At-Tobi	5352	6201	7106
16	Al-Khwaildiah	9630	11158	7869
17	Al-Jarudia	6880	7972	9863
18	Hillat Muhaish	3815	4420	5295
19	Al-Awamiah	14573	16844	33468
20	Safwa	25444	29482	37289
21	Umm As Sahik	6102	7070	9523
22	Al-Duraydi	2500	2897	
23	Al-Awjam	4809	5572	8628
24	Abu Maan	1228	1423	4541
25	Al-Ruwaiha	250	290	

Table 7.1. Population growth in the oases.
Source: Dammam Municipality, 1988, p. 216; Dammam Municipality, 1994, p.
* National Census, 1993 pp. 1 – 26.

Figure 7.7: Aerial view of Al-Qatif (1955).
Source: Dammam Municipality (1997).

Figure 7.8. Customs house at Al-Qatif, showing the city wall (1936).
Source: Dammam Municipality (1997).

development process of converting agricultural areas for residential use has caused a reduction in agricultural land inside the oasis and has disturbed the marine ecology along the sea shore.

The growth of the settlements in the Al-Qatif oasis occurred in three stages: the first settlements were along the line of the coast, the second settlements grew within the oasis itself, and the third settlements were located in the desert region of the oasis (MOMRA, 1976). We shall now look at these three areas of settlement which have affected the Al-Qatif oasis.

7.6.1 Coastal settlements.

These are located on the Gulf coast, and include Tarut island, Al-Qatif, Anik, and Saihat. These settlements are the biggest and most important urban centres in the oasis, particularly Al-Qatif city, the administrative and historical capital. They constitute the sea front of Al-Qatif oasis. They are accessible from most of the other settlements, and indeed part of their importance lies in the fact that they act as interconnections between other oasis settlements and also as connecting points with areas beyond the Al-Qatif oasis region. These settlements are a very considerable source of manpower for the oil industry in the region, quite apart from their importance in providing fish and other foodstuffs.

7.6.2 Agricultural Settlements

Surrounded on all sides by agricultural land, typical settlements of this type are Safwa, Al-Awamiah, Al-Qudaih, At-Tobi, Al- Khwaildiah, Hillat Muhaish, Umm Al-Hammam, Al-Mallaha, and Al-Jish. The settlements are located to the west of Al-Qatif town, and the area that they are in has great influence on the region's agricultural productivity.

7.6.3 Desert Settlements

These are situated between the Dammam-Jubail highway and the Abu Hadria highway, and they include Abu Maan, Al-Ruwaiha, Umm As Sahik, Al-Awjan, Al-duraydi and Al-Nabia. Most of the inhabitants of the desert regions depend mainly on pasture and agriculture. Originally Bedouins, they migrated to this area and settled there because of the availability of water and its proximity to the traditional Bedouin areas (see Figure 7.4) (MOMRA, 1991.)

Figure 7.9. Aerial view of one of Ql-Qatif's settlements, showing the urban growth through the agricultural land.
Source: Dammam Municipality (1997).

After the discovery of oil in the 1930s in Saudi Arabia's Eastern Province great changes took place in the country's economy, its settlement patterns, its oases, and its social life. Al-Qatif oasis has witnessed rapid urban growth of a sort typical throughout the Kingdom during the last three decades (see Chapter Three). The population of the oasis increased in line with the improved economic position of the whole country, and its size increased according to the demand for land to support the increased population. The greater manpower requirement generated by the province's booming oil industry, along with the need for agricultural products from the oasis, made it necessary to connect the villages in the oasis with Al-Qatif city through a road network linked to the highways to the cities of the Eastern Province (see Figures 7.7 and 7.8).

With the increase of population in Al-Qatif oasis (see Table 7.1) there was an increased demand for land to support this rate of growth and to allow for the various activities of the population. This took priority over consideration given to agricultural land and land near the sea. Table 7.2 shows the historical growth of the oasis settlements and how the urbanised areas increased from 1935 to the 1990s (see also Figure 7.6).

	1935	1960	1965	1975	1977	1985	1987	1993
Saihat			62	68		1085		1153
Anak			64	72		267		379
Umm Al-Hammam	3	4.6		7		32		53
Al-Nabia		3			9		112	112
Al-Jish	6	8.5		21		25		29
Al-Mallaha	3.5	6.1		8.5		11		14
Tarut			12	33		440		580
Darin			26	40		41		64
Al-Robeiah			34	43		48		50
Sanabis			38	58		82		124
Al-Zur			2	2		3		8
Al-Qatif			71	90		844		890
Al-Qudaih	6.5	17		21.5		33		51
Al-Behari							7	
At-Tobi	3.5	5.2		7.5		12.5		19.5
Al-Khwaildiah	2	3.1		6		18		23
Al-Jarudia	3.5	6.3		8.5		22.5		34
Hillat Muhaish	2	2.5		3		8		14
Al-Awamiah	5	28		37		75		156
Safwa	23	47		83		198		710
Umm As Sahik		38			38		155	347
Al-Duraydi					30.5		64	82
Al-Awjam		4.5			8		60	101
Abu Maan		10			23		65	65
Al-Ruwaiha							21	21
								5079.5

Table 7.2. Al-Qatif oasis and its settlement growth.
Source: Dammam Municipality (1988); Al-Oqail, 1994, Al-arfaj, 1994, Al-ismail, 1994, Al-robeian, 1994).

7.6.4 Al-Qatif Features

Al-Qatif oasis still carries many of its past features, for example its cultural centre Al-Qala'ah, situated on the coast, which has four gates and consists of narrow streets and buildings close to each other. This Al-Qala'ah fort or castle served in the past as a large warehouse for the storage of spices and perfumes imported from Tarut (see Figure 7.8). The souk Al-Kamis (Thursday market) is a market well known throughout the Eastern Province and even some of the Gulf countries. This is a very old market where merchants gathered to sell all goods produced locally.

Al-Qatif oasis is renowned for its natural water wells, although some of these are now still and others are in disrepair. The best known of these wells are Al-Rabinah, Al-Masonh, Al-Manjory, Umm Al-Sbaa, Al-Mluh, Mualh, Al-Drosh, which, along with others, are scattered throughout the oasis.

Another feature is Tarut island, bounded on three sides by water. It consists of five settlements: Tarut, Darin, Al-Robeiah, Sanabis, and Al-Zur (see Figures 7.4, 7.5, 7.6, and 7.7).

Figure 7.10. Covered souks, Al- Qatif 1953.
Source:Dammam Municipality (1997).

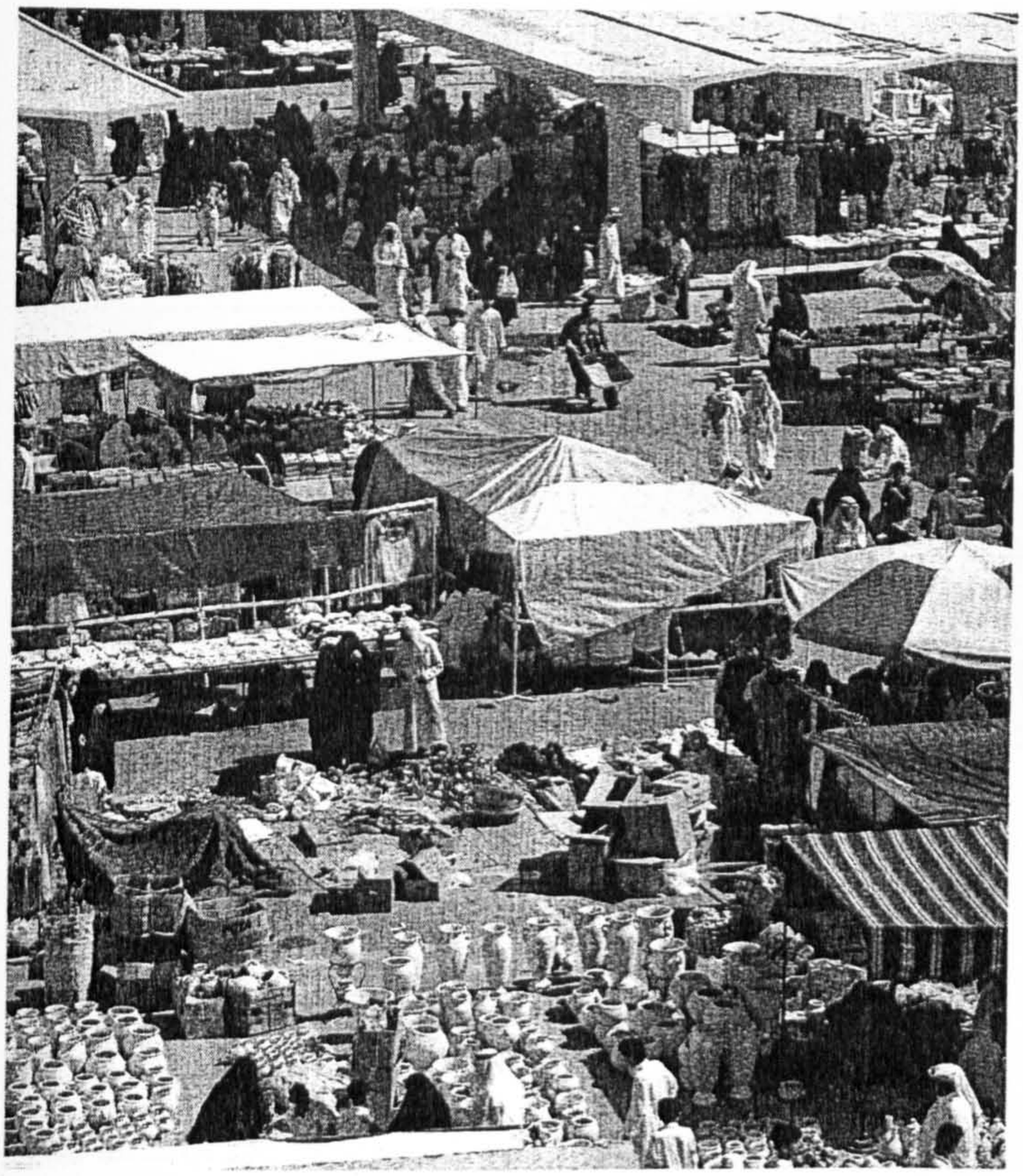


Figure 7.11. Souk Al-Khamis in Al-Qatif.
Source: Dammam Municipality 1997.

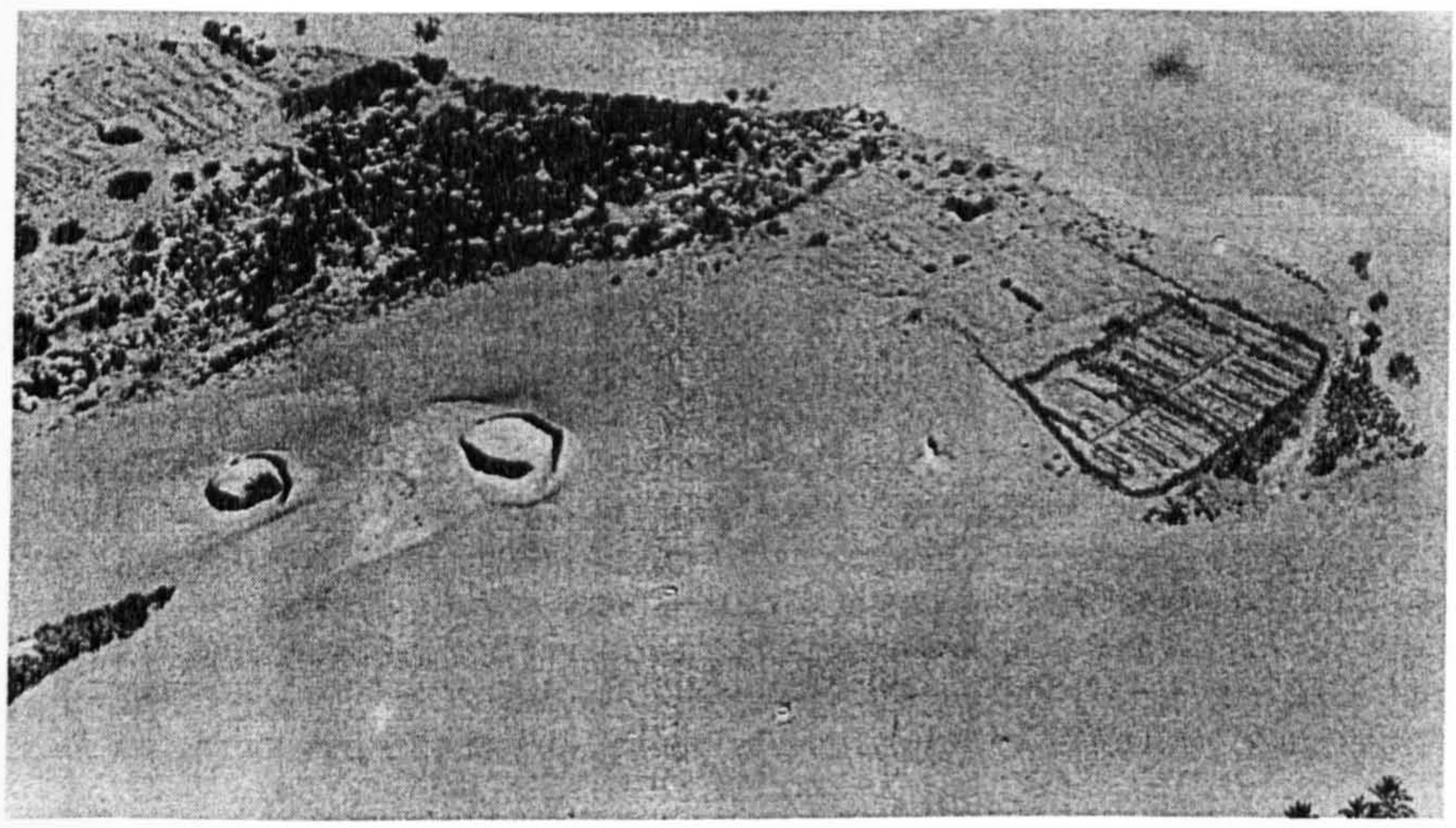


Fig. 7.12. Aerial view of ancient water well system in Al-Qatif (1955).
Source: Dammam Municipality 1997.

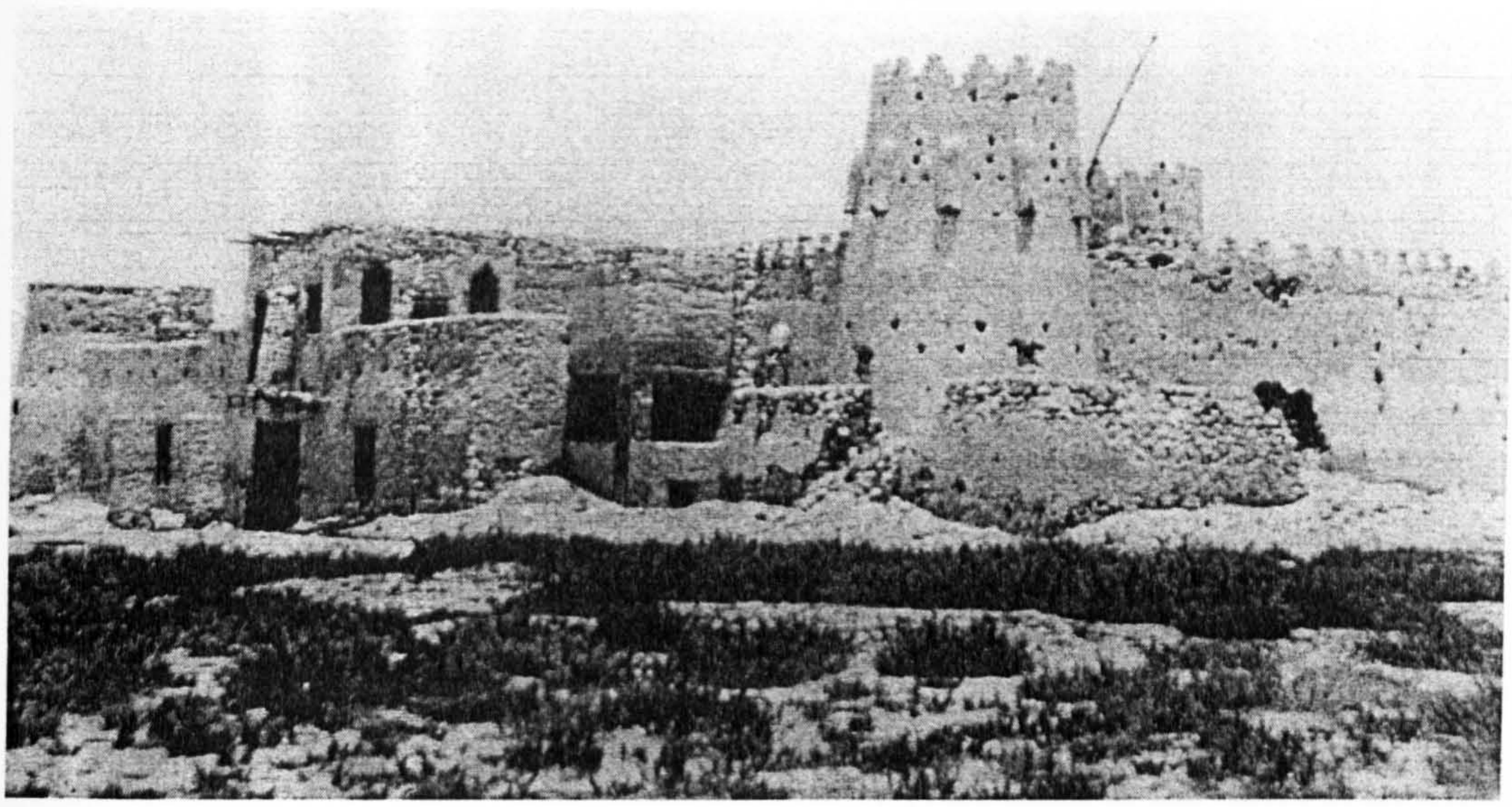


Figure 7.13. Ruins of an old Portuguese port on the Arabian desert - Anik (1945).
Source: Dammam Municipality 1997.

7.7 General Land Use

The land of the cities and villages of the oasis is dominated by residential use, this taking up 32% of the built-up areas. Industry, such as light industries, workshops, and warehouses, takes up about 1.3% of these areas. These activities are concentrated along the main roads of the settlements. Government buildings, such as schools, hospitals, administrative offices, and so on, take up some 1.27% of the built-up areas, most of them being concentrated in Al-Qatif city itself since it is the centre of the oasis, and in Safwa and Saihat. Commercial use, accounting for 1.09% of the built-up land, is distributed among the oasis settlements, and is concentrated on the main roads.

Agricultural areas at present consist of some 5,584 hectares in total and built-up areas about 5,079.5 hectares, including planned and unplanned vacant land. Vacant land is land which currently lies unused and was formerly a green area, but its use has been changed and it has been designated for future non-agricultural utilisation. Vacant land can be classified in various ways: planned vacant land within a developed area, unplanned vacant land within a developed area, or planned vacant land outside a developed area (MOMRA, 1988; Al-Oqail, 1993, Al-Arfaj, K. 1994, Al-Ismail, I., 1994, Al-Robeian, A.1994)

7.7.1 Employment

The employment activities of the inhabitants of the Al-Qatif oasis area can be classified into four groups. The first of these is fishing, and the area is considered the main producer of seafood for the whole region because of the richness of the sea food resources in the Gulf.

The second main area of employment has been trade. In times past Al-Qatif oasis was renowned for its trading activity. Because of its Gulf location it was well placed for accessibility, and the Gulf waters yielded for many years some of the finest pearls in the world. Pearling was a widely practised economic pursuit.

The third area of employment is the government sector, and this is the area which has seen the greatest growth in economic activities in recent times as a result of the oil boom and the job opportunities, and greater financial rewards, presented by it. It is in the public sector that a great many of the population of the Al-Qatif oasis now work, many of them for the Saudi Arabian Oil Company (ARAMCO) (MOMRA, 1991).

The fourth group is farming, until the recent past the major source of agricultural products, especially dates and vegetables, for the regional markets at Dammam, Khobar, and Dhahran, and indeed the entire Kingdom's markets. Working in the agricultural sector has, however, become less and less attractive in recent years because of the impact of the oil industry and the accompanying increase in public sector employment possibilities noted above. There has also been an increase in jobs relating to trade, commerce, housing, construction, transport, manufacturing, and service industries. These have offered wide opportunities for stable employment with rising incomes and they offer therefore a higher standard of living than traditional agricultural activity is now able to do. In addition, the small scale of farming operations, especially on tenanted land, has made it difficult to introduce technological changes, so that this has reinforced the low income level of smallholders, a further factor in making traditional farming less appealing.

7.7.2 Building Conditions

Building conditions can be classified as good, fair, or poor. Good conditions are more prevalent than fair or poor conditions, and they are found throughout the oasis, though concentrated in the new planned areas, where development started in the 1980s. Some of the settlement areas, however, lack good building conditions because the vacant land they have is surrounded by agricultural areas. Good building conditions in the oasis account for about 402 hectares, fair conditions for about 390 hectares, and poor conditions for about 266 hectares. Poor building conditions are concentrated in the old areas of each oasis settlement (MOMRA, 1988).

7.7.3 Building Height

Al-Qatif has both high-rise and low-rise buildings, with most of the buildings being low-rise (one or two storeys). There are also high-rise buildings (three and four storeys) approved by regulations in the major streets of Al-Qatif city, Safwa and Saihat. The oasis also has a small number of five-storey buildings (MOMRA, 1988). There are no buildings higher than five storeys. In general there has been little promotion of high-rise housing or commercial developments, with 94% of the built-up area covered with two-storey buildings, and only 6% with higher constructions.

7.7.4 Public Services

The government's goal is to supply services to all urban and rural centres in the Kingdom. Accordingly the social and physical infrastructure of Al-Qatif oasis is provided by the government to improve individual living standards, as outlined in the National Plans.

7.7.4.1 Municipal Services

There are local municipalities in the Al-Qatif oasis, each one subordinated to and closely interrelated with Dammam municipality. They are:

The municipality of Saihat, which includes the villages of Saihat and Al-Nabia.
The municipality of Anak, which includes the villages of Anak, Al-Jish, and Al-Mallaha.
The municipality of Tarut, which includes the villages of Tarut, Al-Dira, Tarut Al-Jadida, Darin, Sanabis, Al-Robeiah, and Al-Zur.
The municipality of Al-Qudaih.
Finally, the Al-Qatif municipality, which includes the rest of the villages in the central area.

The main aim is to provide services to the oasis through implementing the development projects in its cities and settlements (MOMRA, 1991; Al-Oqail, 1994, Al-Arfaj, K. 1994, Al-Ismail, I., 1994, Al-Robeian, A.1994)

7.7.4.2 Education Services

Al-Qatif oasis is supplied with education services - kindergarten, elementary, intermediate, and secondary schools - for both males and females in all the oasis settlements. There are for males about 68 elementary schools, 33 intermediate schools, and 12 secondary schools, a total of 113, and for females there are 55 elementary schools, 16 intermediate schools, and 8 secondary schools, 79 in all.

7.7.4.3 Health Services

The area has three hospitals, Al-Qatif General Hospital, Safwa Hospital, and Al-Qatif Specialist Hospital. There are in addition 32 health centres distributed throughout the settlements. Al-Qatif has two medical colleges, one for male and the other for female students.

7.7.4.4 Sport and Leisure Services

There are 17 sports clubs in the oasis, and two stadiums in Al-Jarudia and Safwa. An area has been earmarked to provide a large sports centre to serve the entire oasis community.

7.7.4.5 Social Services

The oasis has a social services centre, a social insurance centre, 11 donation agencies, 6 local development agencies, six co-operation agencies, 22 kindergarten, and seven donation clinics (health centres).

7.7.4.6 Commercial and Recreational Areas

The municipality plays a vital role in providing facilities for commercial and recreational areas both in planned and new areas. Examples include public commercial areas like fish markets, the Thursday markets, and other small commercial localities distributed throughout the oasis. Recreational areas include the corniche connecting the oasis with Dammam and Khobar, a large project which serves the entire population of the Eastern Province and the Gulf area. There are also public gardens such as the general public park in Al-Qatif city, Al-Mantakh Al-Khamesa Garden, Darijn Garden, and the general public park in Saihat.

7.7.5 Public Activities (Infrastructure)

7.7.5.1 Transport, Electricity, Water, Telephones, and Drainage

With the inception of the oil industry a sudden and progressively growing demand for labour supply was created, and this triggered a population influx into the cities, towns, and rural settlements in the oasis. The increasing need for housing and food made it necessary for the settlements to be interconnected by road.

All settled areas in the Al-Qatif oasis are now connected through a major transport system. The main roads are those which run north from Dammam city to Al-Qatif

city though Saihat and north to Ras-Tannurah and Jubail. Al-Qatif city has two further highway exits, one through Al-Jish and the other called Al-Hdlah.

Most of the oasis settlements are supplied with electricity, water, telephones, and drainage utilities. Indeed all have electricity, which also covers most of the newly planned areas, whether inhabited or not. The locations Al-Duraydi, Abu Maan, Al-Ruwaiha, Al-Nabia, and Hasm Umm As Sahik have no drainage, but most other settled areas are provided with this utility. While telephones are generally available, there is limited coverage in Umm Al-Hammam, Al-Jish, Al-Mallah, Hillat Muhaish, Al-Jarudia, Al-Khwaildiah, Umm, and As Sahik, and the communities of Hasm Umm As Sahik, Al-Ruwaiha, Al-Awjam, and Al-Duraydi are not covered at all.

7.8 Development Constraints and Potentials

Constraints on and areas of potential for development in the Al-Qatif oasis are factors which are basic to the economic background of the area, and may be summarised as follows:

The Arabian Gulf. Located to the east of the oasis area, the Gulf is a major economic advantage in that it provides employment opportunities in activities such as fishing, and boating, typical of the Gulf waters.

Agricultural land. The oasis has a vast amount of agricultural land, which can provide a high production rate for the immediate area, and for the regions beyond it. It can also offer employment potential for many inhabitants of the oasis zone.

The private government area. This is represented by the ARAMCO reserved area, which consists of oil wells and their requirements. These are very important areas both at the regional level in particular and the national level in general.

King Fahad Airport. This is the major transport access to the region, and it will provide many employment opportunities for personnel required to man and administer it.

Public infrastructure. This covers public building and areas such as water pumping zones. Many employment possibilities are provided through these for the oasis dwellers.

Transport system. This is represented by the freeways such as the Abu Hadrih highway, the Ras Tannurah - Dhahran - Jubail road and other major roads. These are major development factors in the oasis region.

Built-up centres. These, of which there are some 25, differ in size, function, and density, and are distributed throughout the region.

Other development potentials. There is development potential in the vacant land, whether planned or unplanned, and other land not used for agricultural purposes in the Al-Qatif oasis region.

7.9 Previous Planning Study

The unprecedented economic growth of Saudi Arabia in the wake of the oil boom of the early 1970s gave rise to the phenomenal development of cities and towns, creating various problems relating to a whole range of urban services and facilities (Al-Hathloul and Anis-Ur-Rahman, 1985) (see Chapter Three for more detail). In order to deal with this the government set in motion an ambitious programme of formulating and implementing a series of urban, regional, and national plans. International consultants and local planners were, as a result, drafted in to prepare regional physical plans and master plans for a number of major cities and towns in the country, and to study urban growth boundaries for about 100 cities.

7.9.1 Al-Qatif Master Plan

The year 1973 saw the initiation of the development of regional physical plans, master plans, and detailed area studies for the cities Dammam, Khobar, Al-Qatif, Al-Hassa, and Jubail in the Eastern Region by the international consultants G. Candilis-Metra.

The aim of Al-Qatif master plan was to preserve the natural environment and the agricultural character of the area, while at the same time allowing for the controlled and organised expansion of the existing small towns and their supporting functions within new residential areas. The plan was moreover intended to provide for the creation of small centres with recreational and cultural functions (MOMRA, 1976).

Within the framework for a regional plan and development programme the intention was for the area of Tarut island and the Al-Qatif oasis to remain, as much as possible, in their existing state. The oasis was to be preserved and at the same time developed by all possible means (see Figures 7.14 and 7.15).

The small towns in this sector were to be expanded mainly towards the sea on reclaimed land without causing damage to the green areas of the oasis.

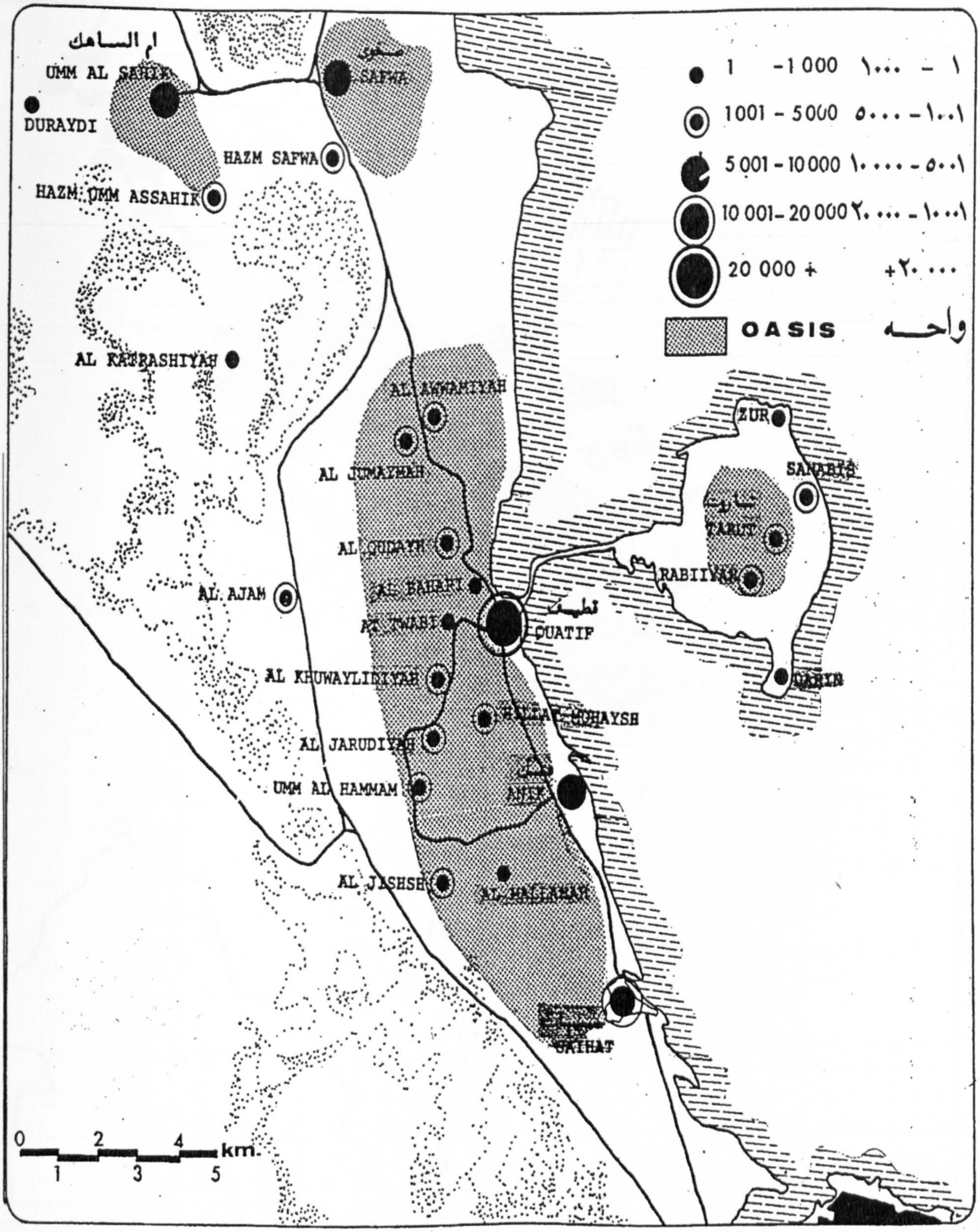
The northern sector, an integral part of the whole urban system of the central block, offered potential as an ideal residential area all year round (MOMRA, 1976.)

These plans were originated in the context of national socio-economic objectives, spelt out in the first Five Year Development Plan (1970-1975) (see Chapter Three).

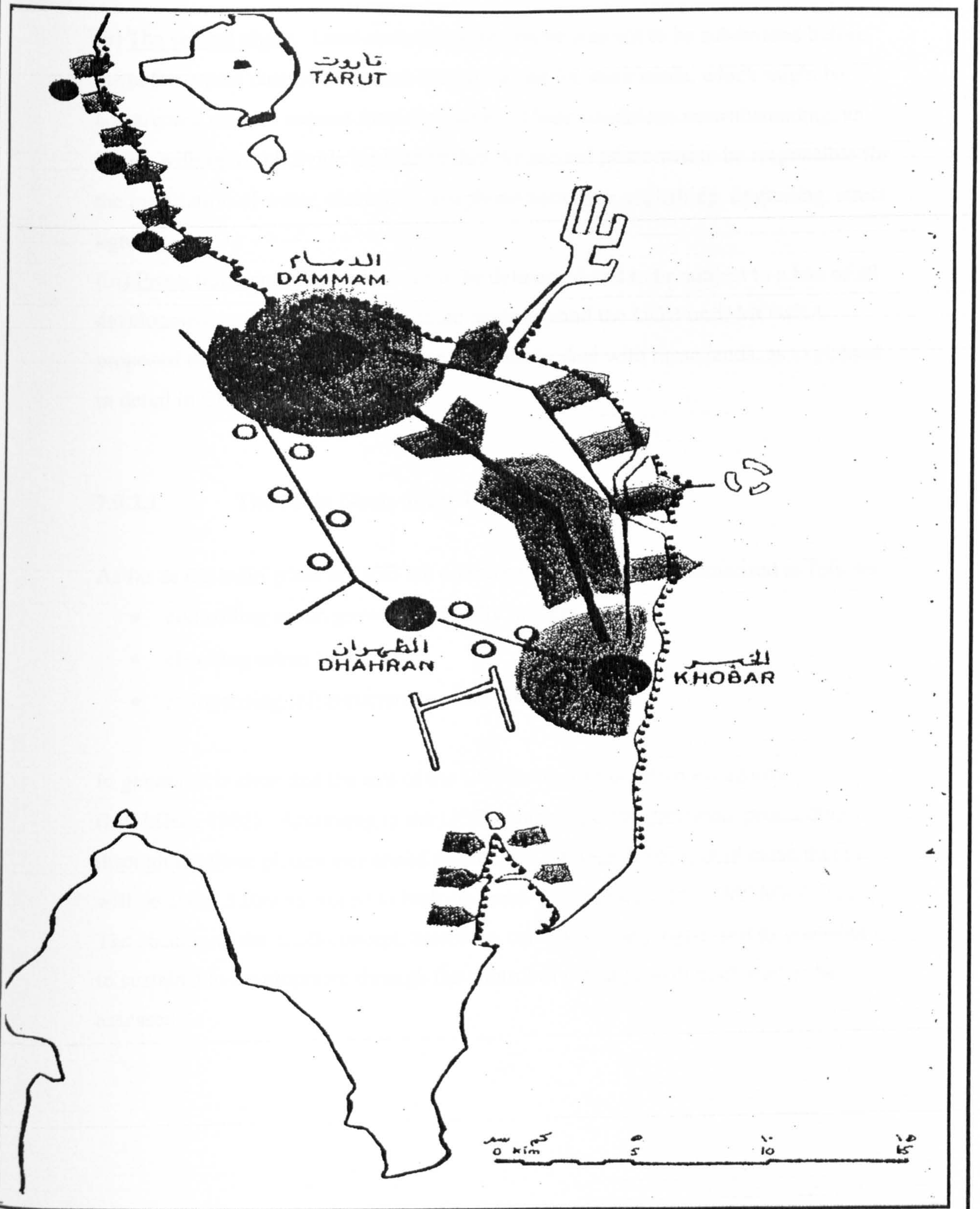
7.9.2 Urban Growth Boundary (UGB)

In 1989 the Council of Ministers approved UGBs for 100 cities and towns. The UGBs comprised (i) first phase UGB, (ii) second phase UGB, and (iii) protection zones, with the following stipulations:

(i) The first phase. Land covered by this phase was to be subject to land subdivision without a request from the owner provided that the land dedicated to roads and municipal services did not exceed 33%.



Al-Qatif Oasis and its settlements in 1976	Figure: 7.14
● population size **Source:** Al-Qatif Master Plan (1976)	N



Al-Qatif Master plan (1976) Existing and Proposed Development Trends.	Figure: 7.15
⇨ Proposed ● Existing	N

(ii) The second phase. Land covered by this phase was not to be subdivided before the enforcement date of this phase except for use for main roads, which might be constructed without request from the owner. These conditions notwithstanding, an owner willing to subdivide his land within the second phase was to be responsible for the installation of water, electricity, telephone networks, asphalting, upgrading, street lighting.

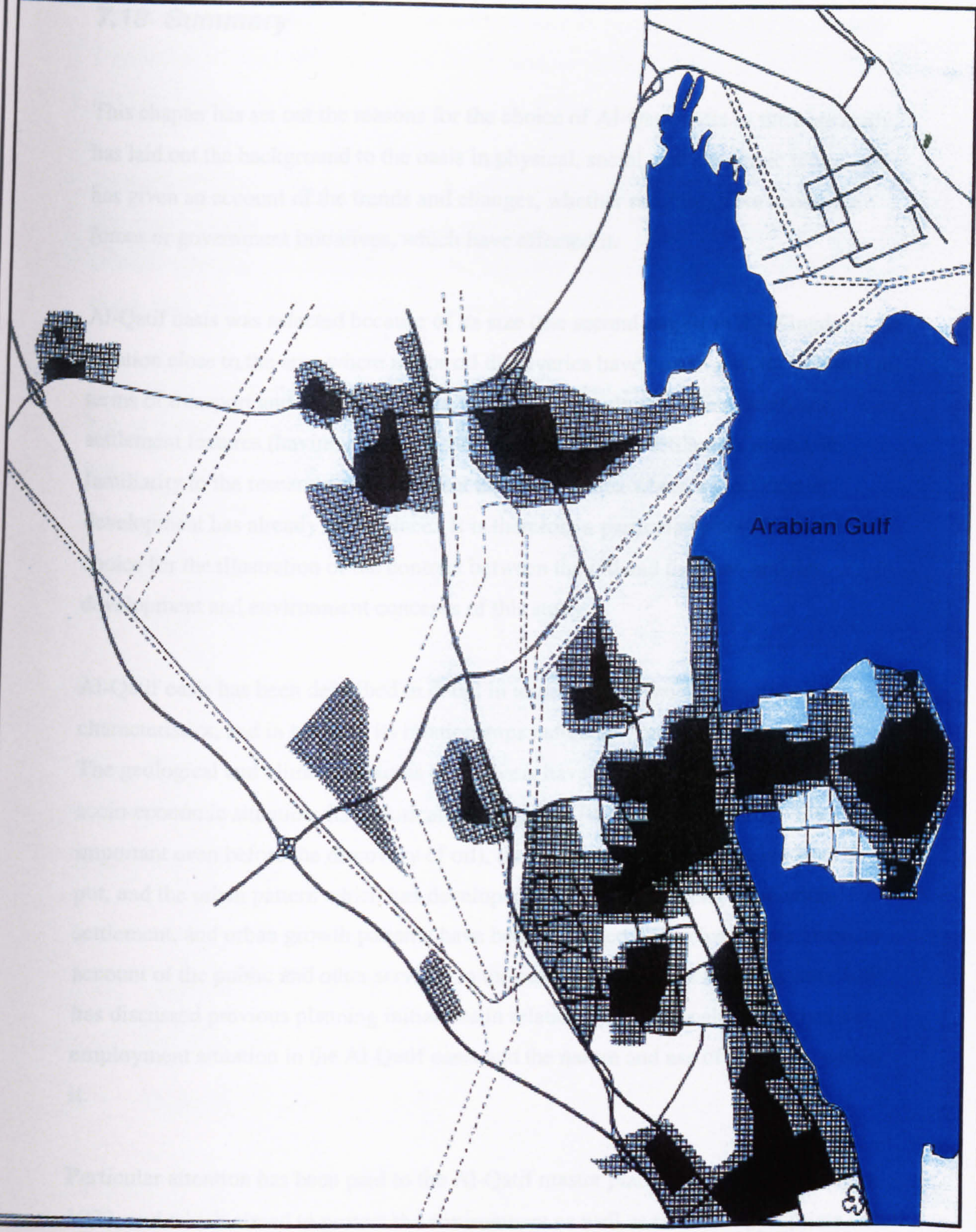
(iii) Protection zone. This zone was to be delineated and to be subject to a ban of all development and subdivision of private lands beyond the UGB until MOMRA proposed the methods and control mechanisms to deal with these lands, as explained in detail in Chapter Six.

7.9.2.1 The Main Goals of the UGB

As far as the main goals of UGB are concerned, these can be summarised as follows:

- controlling urban growth, especially random growth
- checking urban sprawl
- rationalising infrastructure use and operation.

In general it is clear that the aim of the UGB is to control urban expansion (MOMRA, 1988). According to the UGB planned growth provision, procceding through the three phases mentioned above until the year 2005, should mean that there will be about 5,059 ha. added to built-up areas (see Figure 7.16.) (MOMRA, 1988). The success of the UGB concept, therefore, can not yet be judged, and its contribution to sustainable development through the control of urban growth must wait to be assessed.



URBAN GROWTH BOUNDARIES OF THE QATIF OASIS	**Figure: (7.16)**
First stage (1995) **Second stage (2005)**	N SCALE 1:150,000

7.10 Summary

This chapter has set out the reasons for the choice of Al-Qatif oasis as the case study, has laid out the background to the oasis in physical, social, and economic terms, and has given an account of the trends and changes, whether resulting from economic forces or government initiatives, which have affected it.

Al-Qatif oasis was selected because of its size (the second largest in the Kingdom), its location close to the area where major oil discoveries have been made, its situation in terms of transport and accessibility, its variety of agricultural, commercial, and settlement features (having coastal, agricultural, and desert settlement areas), its familiarity to the researcher, and the fact that it is an area where a great deal of development has already taken place. It is therefore a particularly advantageous choice for the illustration of the contrast between the old and the new, and the development and environment concerns of this study.

Al-Qatif oasis has been described in detail in terms of its physical setting and characteristics, and in terms of its relationships nationally, regionally, and locally. The geological and climatic features of the oasis have been described, as have its socio-economic situation, its historical development (it was commercially very important even before the discovery of oil), the general use to which its land has been put, and the urban pattern which has developed there. The changing population, settlement, and urban growth patterns have been indicated. The chapter has given an account of the public and other services in the oasis, as well as its infrastructure, and has discussed previous planning initiatives in relation to it. It has also described the employment situation in the Al-Qatif oasis and the nature and use of buildings within it.

Particular attention has been paid to the Al-Qatif master plan, which was drawn up in 1973, and which aimed to protect the environment as well as to allow appropriate controlled urban growth and development.

The Al-Qatif area is affected by, and will continue to be affected by, Urban Growth Boundaries (UGBs), as approved by the authorities in 1989. These UGBs are described and their stipulations and goals are set out.

Throughout the chapter the features and characteristics of the Al-Qatif oasis which it introduces, and the trends and changes related to it, are copiously illustrated by detailed maps, figures, and tables to give a general overview of the existing situation of the oasis, and how it was and what it became.

The next chapter will introduce and analysis the impact of this development and the lose of the natural resources of the Oasis, and other factors that contributed to this lost.

Chapter 8

The Impact and Analysis

8.1 Introduction

This chapter consists of two parts. The first part will concentrate on the negative impact of the physical development in the Al-Qatif oasis and its settlements. In addition tables, plans, and Figures will be presented to show some of the existing problems which have resulted from physical development and which decrease the natural resources of the oasis and its settlements.

The second part of the chapter will discuss and analyse the data collected in the researcher's fieldwork (Al-Qatif oasis and its settlements), along with Figures, document reviews, previous chapters in this thesis, and the researcher's field survey (questionnaire and interview) to evaluate and assess the previous factors identified from Chapters Two, Three, Four, Five, Six, and Seven, which are the lack of comprehensive environmental and sustainable physical development policies at the national level, the lack of public participation and education, and lack of co-operation and integration.

These factors have increased the loss of the natural resources of the Al-Qatif oasis and its settlements. The second part of the chapter will highlight these factors and the impact of them on the loss of the natural resources of the oasis, and this account will be supported by evidence such as Figures, tables, maps, interview and questionnaire responses, and other methods explained in Chapter One.

8.2 The Impact of Urban Growth on the Natural Resources of the Oasis

Al-Qatif oasis is a historical region which has witnessed many ancient civilisations. Within it are 25 settlements of various sizes as listed in Chapter Seven, Section 7.3.3 (see Figures 7.4 and 7.5). Most of these settlements have grown rapidly in recent decades, as is the case with all cities in the Kingdom, due to the growth in industrial activities brought about by the boom in oil prices and the increased demand for manpower required by the oil industry. The boom in the oil industry in the Eastern Province, along with the need for agricultural products from the oasis, made it

necessary to connect the villages in the oasis with Al-Qatif city through a road network linked to the main highways leading to the chief cities of the province, as indicated in Chapter Seven, Section 7.7.5 and Figures 8.2, 8.5, and 8.7.

8.2.1 The Impact on the Agricultural Land

Within the oasis the stock of agricultural land shrank within the three decades from 1965 to 1994 from 7,534 to 5,798 ha., while during the same period land under urban development grew from a mere 495 ha. to 5,079.5 ha. In addition to this, land reclamation from the seabed has been taking place in order to meet the demand for urban development.

Al-Qatif city is one of the most ancient cities in history. It began to emerge with the construction of Al-Qala'ah (the fort), which was initially built as a military base, then as a depot for the storage of goods, armaments, and spices imported from Tarut island. Al-Qala'ah was converted to a residential palace and became the capital of the Al-Qatif region, with a total estimated area at that time of 11.5 ha. It was surrounded by a thick gypsum, mud, and stone wall 5 m high. Four forts were built inside to protect the area against enemies, and there were four main gates in the wall to provide access. It was from this original citadel that random expansion began towards the agricultural land (Al-Arjaf, 1994).

At present, after the discovery of oil, Al-Qatif is greatly increased in size and population. With this increase large numbers of the population began to expand over the agricultural land areas (see Table 7.1, which shows the population growth of Al-Qatif oasis and its settlements.) Figures 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10 illustrate urban growth over the agricultural land of the Al-Qatif cities and other settlements in the oasis.

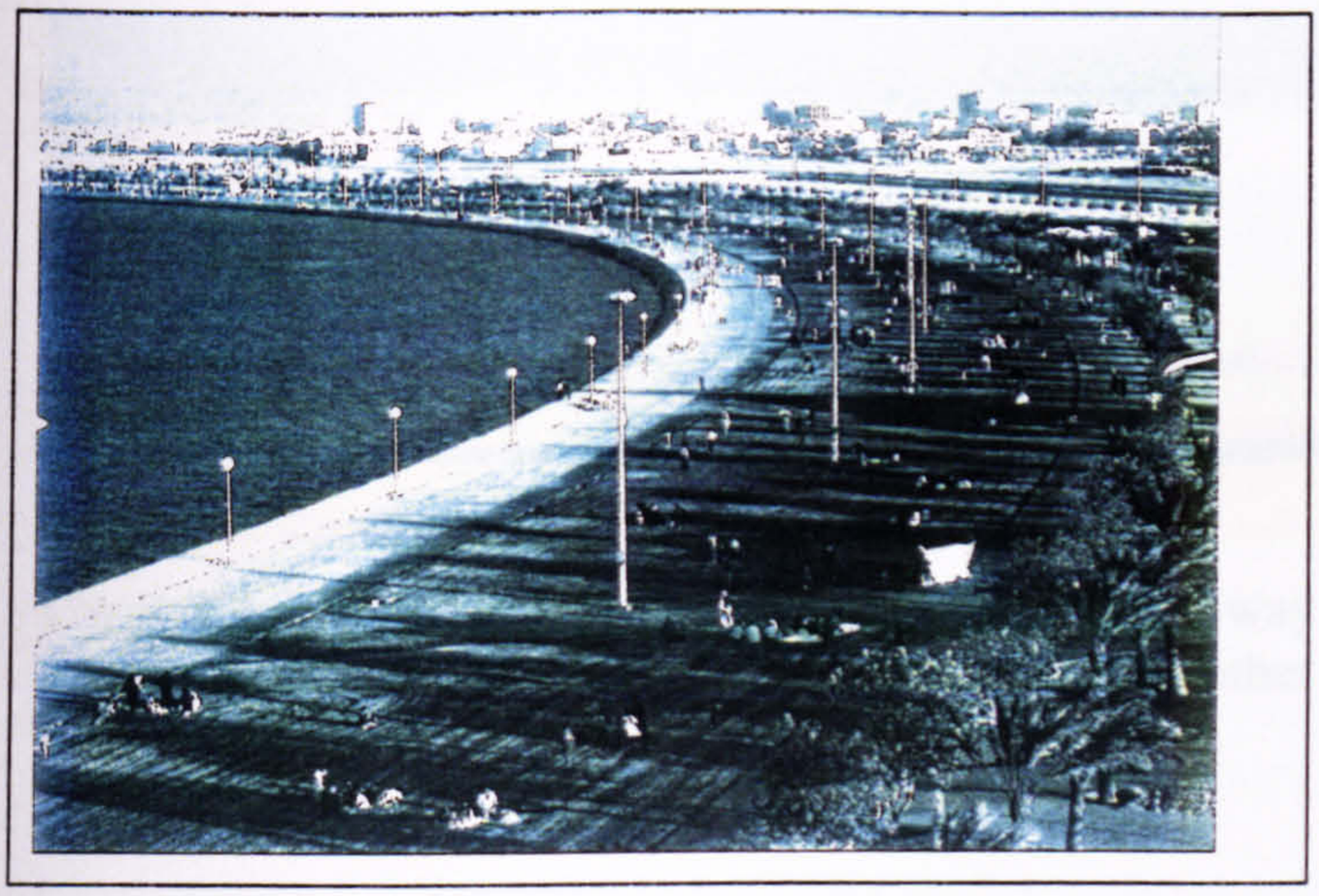


Figure 8.1. The corniche project as a recreation area in the Eastern Province, which connects Dammam city, Khober, and Al-Qatif oasis. The Figure shows the Dammam part.
Source: Dammam Municipality (1997).

Figure 8.2. One part of the corniche project in Khober.
Source: Dammam Municipality (1997).

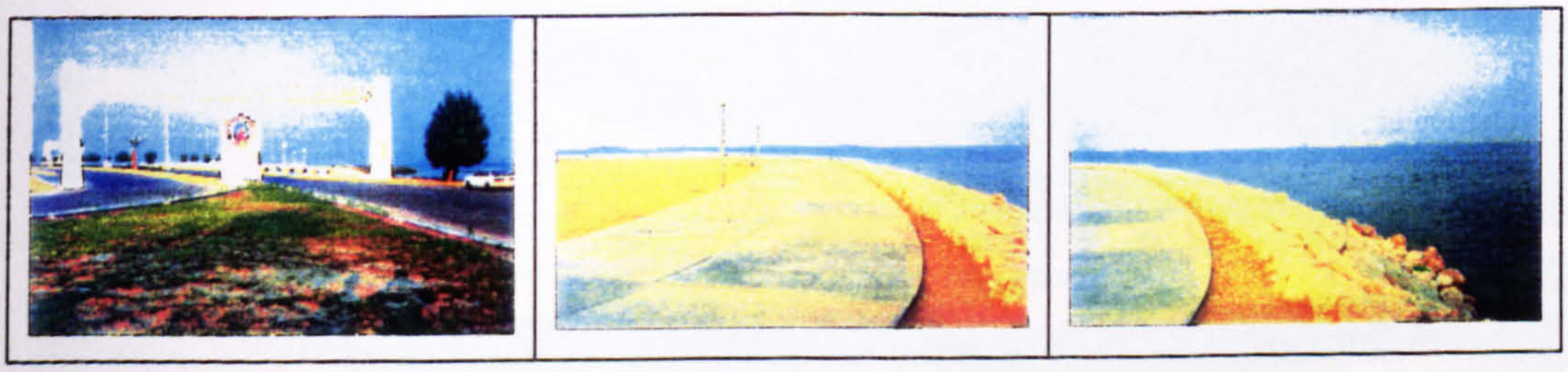


Figure 8.3. Part of the corniche in Al-Qatif.

Figure 8.4. Panoramic view showing Abohadriah highway as part of the Hyeg transportation system, which connects the oasis with other parts of the Eastern Province.

Figure 8.5. Panoramic view showing the housing project in Al-Qatif oasis.

Figure 8.6. Panoramic view towards the new Al-Qatif sport city, which serves all the oasis settlement population.

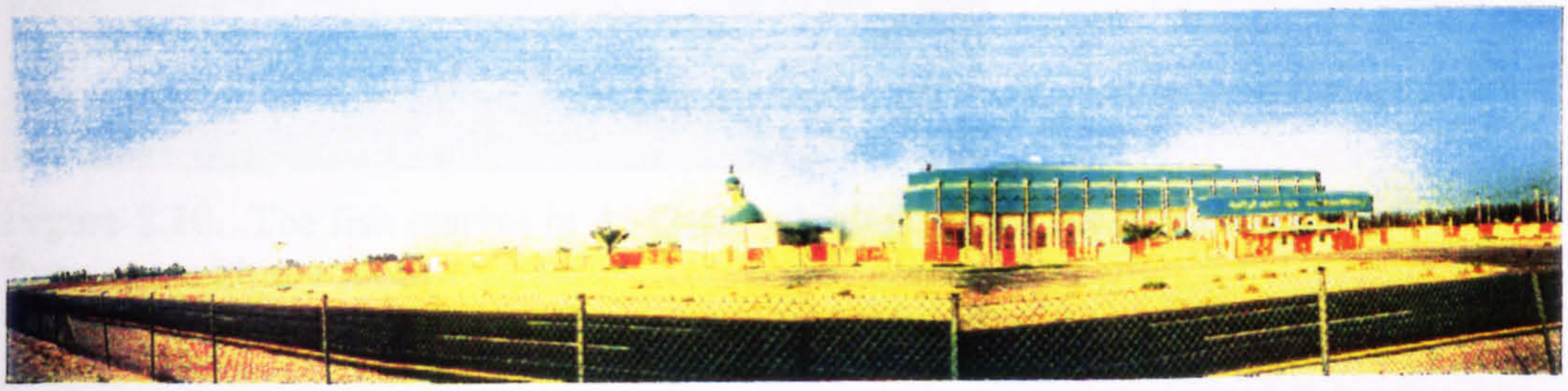


Figure 8.7. Another panoramic view of the new Al-Qatif sport city, which serves all the oasis settlement population

Figure 8.8. Panoramic view showing the Al-Qatif General Hospital, one of the Eastern Province's biggest hospitals serving the oasis and the region.

Figure 8.9. Al-Qatif municipality in Al-Qatif city.

Figure 8.10. The fish market in Al-Qatif, which provides the oasis and the Eastern Province with sea food.
Source: Dammam Municipality (1997).

Figure 8.11. Souq Al-Kamis (Al-Kamis market) from outside (for the interior view see Figure 7.11). This is the biggest traditional market in Al-Qatif oasis and it attracts people from all over the Eastern Province.

Figure 8.12. The old part of Sayhat city.

Another example which may be given of the impact of urban growth on the resources available to the communities of the Al-Qatif oasis is Sayhat (Figure 8.12), a town with a distinguished history. It is known to have been a flourishing settlement by the beginning of the fourteenth century, and one historian considered it the richest town in the whole oasis, with about 30 pearling boats sailing from its harbour. There were about 600 houses, around 400 of which were within the boundaries of the old town, and 200, mainly huts and shacks, outside (Al-Arjaf, 1994).

The prosperity of this period, however, did not endure. But after the discovery of oil in the region the town began to flourish again and it developed to such an extent that it became the second largest town in the oasis after Al-Qatif (see Table 7.1). The built-

up area expanded from 68 ha. to 1085 ha., that is a 16-fold expansion. This development was, of course, at the expense of agricultural land, which was reduced greatly, not only in the north, south, and west but also on the land bordering the sea in the east.

Another town, Anik, was also a historical community as can be confirmed by the evidence of archaeology and by its architecture. A famous Portuguese castle was situated near the town on the coast (see Figure 7.13). The urban growth of Anik was particularly rapid (see Table 7.2), and this growth took place at the expense of the agricultural land strip, which suffered a reduction in area of 130 ha.

With the development of all the sectors in the oasis settlements the population increased in each (see Table 7.1), which led to a corresponding rise in the demand for land for urban use. Table 7.2 shows the increase in urban land use in each settlement. Figure 7.6 indicates the urban growth history of the oasis and shows how this growth took place over agricultural land. To take one example, Safwa started as a rural settlement surrounded by palm trees. Before the discovery of oil the people of Safwa mainly depended on agricultural, fishing, and diving. After the discovery of oil and the improvement of the infrastructure, such as the construction of Ras-Tanura port and the highway, the urban area became open to development. The area for urban development increased from 23 ha. in 1935 to 710 ha. in 1993 causing much destruction to agricultural land (see Table 7.3 and figure 7.5 in Chapter 7).
Al-Awamiah was in 1935 about 5 ha in area; it increased to 156 ha. in 1993, causing considerable destruction to the agricultural land.

Figure 8.13. The planned area in Al-Awamiah

Al-Qudaih, as shown in Table 7.3 and Figure 7.6, was originally a rural settlement inhabited by farmers. It gradually developed into one of the biggest cities in Al-Qatif oasis, increasing from 6.5 ha. in 1935 to 51 ha. in 1993. All this increase took place on agriculture land because Al-Qudaih was surrounded by agricultural land on all sides.

Figure 8.14. The entrance to Al-Qudaih at the present time.

Other settlements such as Atobi, Al-Khwaildiah, Al-Jarudia, Hilat Muhaish, Umm Al-Hammam, Al-Mallaha, and Al-Jish are located in the centre of the Al-Qatif oasis where they are surrounded by agricultural land (palm trees) on all sides, and where any expansion is going to take place over this valuable resource. Table 7.3 and Figures 7.5 and 7.6 show the total increase of all these settlements to be from 58 ha. in 1935 to 1103 ha. in 1993, with the loss of 1045 ha. of agricultural land to urban activities.

Figures 8.15 and 8.16. Aljarudiah village entrance and the main road leading to Al-Rabiah, Snabs and Al-Zor.

Other settlements which have adjacent agriculture areas on one or two or three sides and located in the desert area are Al-Nabia, Umm Assahik, Al-Duraydi, Al-Awjam,

Abu Maan, and Al-Ruwaiha. In Al-Nabia the built up area increased from 3 ha. in 1960 to 112 ha. in 1993 (see Table 7.3). This resulted in the reduction of agricultural land by 109 ha. The built-up area of Umm Assahik increased from 38 ha. in 1960 to 347 ha. in 1993, and that of Al-Duraydi from 30.5 ha. to 82 ha. in 1993. Al-Awjam increased from 4.5 ha. in 1960 to 101 ha. in 1993. The built-up area of Abumaan increased from 10 ha. in 1960 to 65 ha. in 1993, and finally Al-Ruwaiha has a total built-up area of 21 ha.

8.2.2 The Impact on the Coastal Land

Agricultural land, however, was not the only terrain to be affected by the urban development; even the configuration of the coastline was altered, resulting in the loss of 1750 ha. to landfilling over the last three decades (Al-Arjaf, 1994; Dammam Municipality, 1996) (see Figure 7.6 and Table 7.2). Al-Qatif, Sayhat, and Anik in particular have experienced urban development because of their coastal locations, as has the island Tarut. Tarut, indeed, has been especially affected by urban growth and by the construction of the corniche road.

Figure 8.17. Land filling activities in the area which affects the natural habitat of the sea.

Figure 8.18. The fish market in Tarut.

The loss of sub-tidal habitat in Tarut bay is of particular concern. The seagrass beds and mangrove strands of the bay are known to be spawning and nursery grounds for commercially important fish and shrimps, and food for many commercially important species is to be found among the seagrass roots. Seagrass roots and blades also provide shelter for larval and juvenile forms of some commercially important species.

Figure 8.19. Snabs corniche.

Dredging and landfilling in Tarut bay are undoubtedly reducing the extent of the seagrass biotope, with unknown consequences for the total marine ecosystem or the sustained yield of local fisheries.

Figure 8.20. The preparation of new landfilling in Al-Qatif city.

Figures 8.21 and 8.22. The machine pumping the soil from the sea to be used for landfilling .

Figure 8.23. A habitat for minute organisms has been destroyed by landfilling.

Figure 8.24. Panoramic view showing the remainder of the natural habitat for minute organisms and some of the trees cut down and deposited in the sea.

Some of the last strands of mangroves are located in the Tarut bay and some have already been eliminated by landfilling. Mangrove strands help to form a complex ecosystem since the roots of these trees trap sediment and provide a habitat for many minute organisms during all or part of their life cycles. Mangrove strands also supply a unique biotope for specialised macro-invertebrates and fish through the element of structure that they bring to shoreline areas. Clearly, when their habitat and communities are covered by landfilling, these creatures are lost forever to the marine ecosystem. Landfilling consequences may also stretch far beyond the area of immediate impact because of its effects on water flow patterns, levels of salinity, temperature, oxygen supply, the suspension of sediment, increases in torpidity, and the possible release of sediment-bound toxicants. Many of the fauna associated with seagrass and mangroves are highly susceptible to damage from siltation, either from direct smothering , depression of available dissolved oxygen, or exposure to the release of materials bound up in the sediment (Cole and McCain, 1990).

In addition, as a result of land reclamation from the sea bed the size of Tarut island increased from 1260 ha. in 1958 to 2850 ha. in 1993 (Al-Ogail, 1994; Dammam Municipality, 1996). Reclamation of land from the seas has negatively affected the configuration of the island, which is undesirable from a geological point of view. The alteration of the coastline has already killed many employment opportunities in prawn and lobster fishing and carries a similar threat to pearling activities. The long term ecological consequences are yet to be studied.

In addition, land which is still under water has already been allocated to private parties. Presumably this land will be reclaimed by landfill in the near future, which will completely destroy the coastal ecology and economy.

Landfilling has resulted in blocking the flow of water and has slowed the natural flushing action, which can make the area more susceptible to water pollution. Because of tides and other water movements litter and other material has spread along locations like Tarut and Al-Qatif. This can interfere with the movements of animals, such as turtles, across beach areas.

Figure 8.25. Soil is taken from the sea bed and then used for filling.

Figure 8.26. Panoramic view showing the final appearance after landfilling of an area which has then been used for the construction of housing and other urban purposes.

Figure 8.27. Landfilling by sand, felled trees, and dirt in Tarut and Al-Qatif, which affects the movement of sea animals.

8.2.3 The Impact on the Air

A further matter of major importance within the Kingdom of Saudi Arabia is the air pollution in the Eastern Province. The Eastern Province suffers because of its location near Kuwait, which produced pollution after the Gulf War. This is a particular cause for concern since the largest industrial city in the kingdom, Jubail, is located north of the case study area, Al-Qatif oasis.

The importance of the existence of the green areas in such urban and industrial cities has been recognised and proposals have been put forward by many planners and landscape architects to reduce air pollution and enhance the environment.

Land uses and urban activities change the micro-climate conditions, which can intensify air quality concerns; industrial and other contaminants being loaded into the air can affect health and economic resources.

A study of air quality by Saudi Aramco Air Quality and Meteorology Network (AMMNET) has been undertaken in the Eastern Province. It was carried out at seven air quality monitoring stations, one of them in Tarut island in Al-Qatif oasis, to measure the air pollutions such as sulphur dioxide (SO2), hydrogen sulphide (H2S), nitrogen dioxide (NO2), ozone (O3), and inhalable particulates (IP). The Tarut island

station recorded excesses of hydrogen sulphide over hourly and daily mean standards. However in general the monitoring result was in compliance with MEPA standards (see Table 8.1).

Pollutant	SO2 Ug/m3			H_2S Ug/m3		
Year	Max Hr	Max 24 Hrs	Yearly Mean	Max Hr	Max 24 Hrs	Yearly Mean
1985 (1)	398	63	14			
1986	817	126	12			
1987	257	86	11	68	39	13
1988	487	68	13	300	42	12
1989	128	37	13	223	45	08
1990	469	63	14	201	43	07
1991	351	65	21	258	54	11

Table 8.1. Tarut island air quality: historical summary.
Source: Saudi Arabian Oil Company (1992).

In addition a study has been carried out by the Jubail Industrial City (JIC) about the air quality in JIC in the Eastern Province north of Al-Qatif oasis. Table 8.2 shows the yearly average concentration recorded between 1979 and 1992 of nitrogen oxide, carbon monoxide, ozone, and sulphur dioxide parameters. It was estimated that the share of Eastern Province in the sulphur dioxide and nitrogen oxide emissions in 1986 (at 38% and 34% respectively) was more than any region in the kingdom.

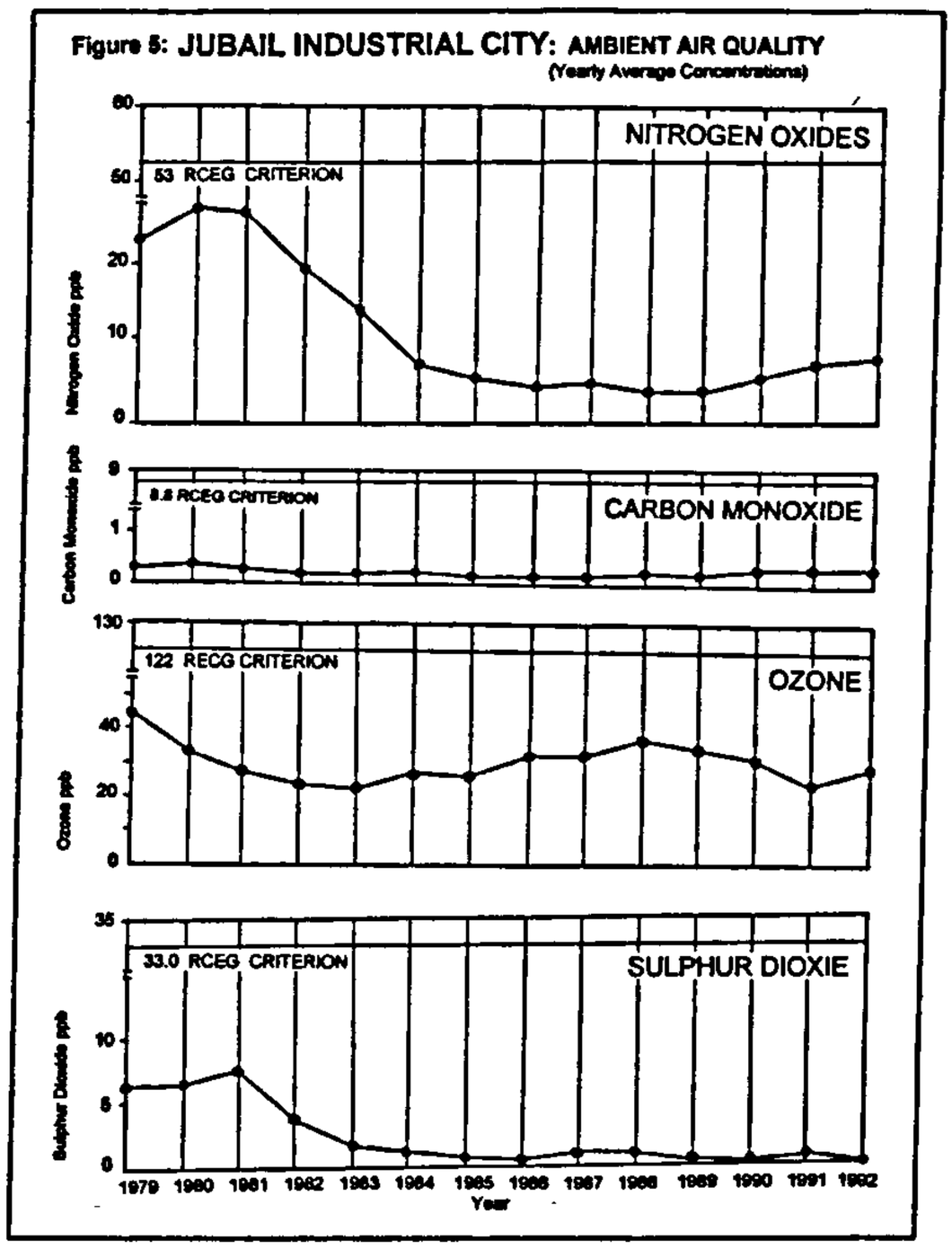


Table 8.2. The ambient air quality as measured by yearly average concentrations in Jubail Industrial City north of Al-Qatif oasis.
Source: Benna and Al-Deufi (1999).

The buildings, pavements, and concrete of inner cities absorb and store larger amounts of solar radiation, because of their geometry and high thermal admittance, than do the vegetation and soil typical of rural areas, and this has played a part in the creation of urban heat (Detwyler, 1971).

Amongst the various benefits from the protection of the agricultural land of the oasis which have been demonstrated by many empirical research studies, there is the fact that trees and green areas in general play a major role in lessening the temperature of micro-climates. For example, temperature measured on a grass lawn was found to be 10-14° F lower than a bare soil surface (Kadi and Ibrahem, 1981). In another study in Frankfurt during a hot summer day the trees and green area reduced the temperature by 3.5° C in comparison to an adjacent unshaded area (Adams et al., 1979). In addition trees, vegetation, and green areas can improve the human environment through their ability to reflect, obstruct, and absorb solar radiation.

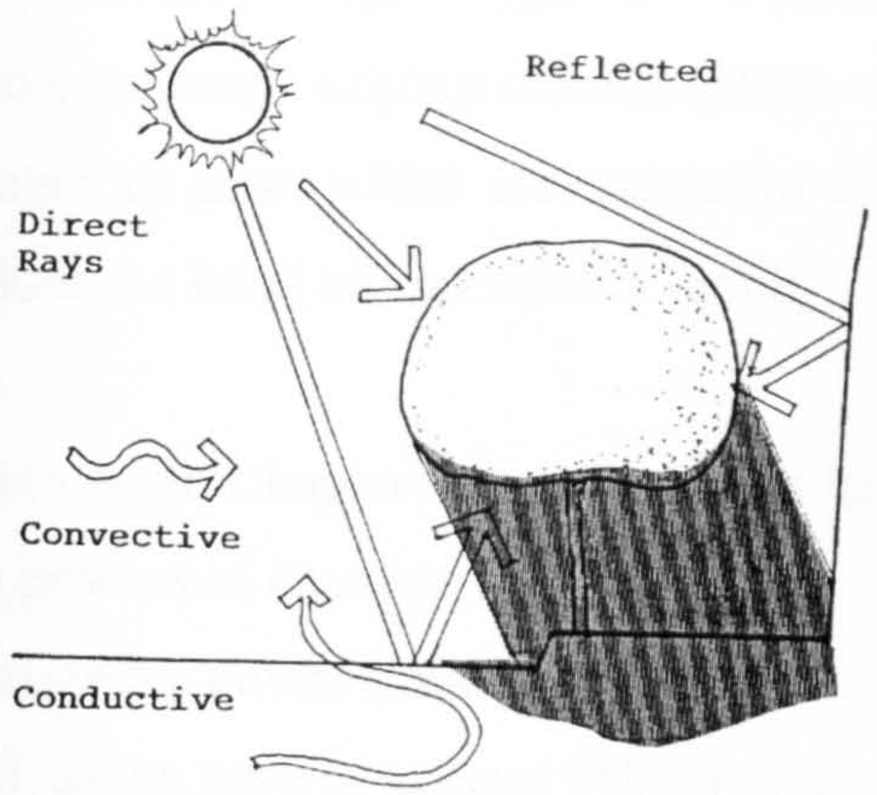


Figure 8.28. Solar radiation controlled by trees.
Source: Al-Awais (1991).

Trees can also control winds by obstructing the main stream, deflecting the direction , filtering dust from the air, and controlling wind speed. For example one study shows

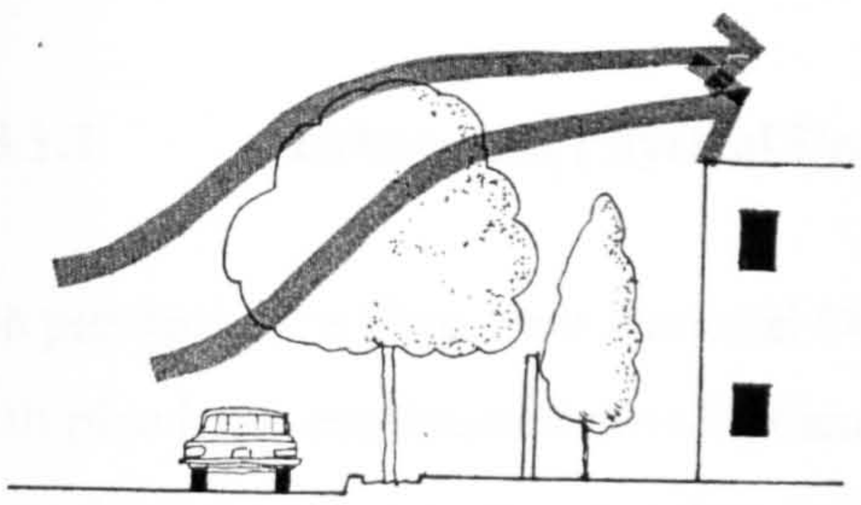


Figure 8.29. The effect of trees in lifting the wind.
Source: Al-Awais (1991).

that wind speed can be reduced by 20% by a normal green belt (Bondagji et al., 1980). In another study it was found that within a distance of from 10 to 20 times a tree's height wind can lose up to 50% of its original velocity if its progress is interrupted by the tree (Kadi et al. , 1981).

Further, trees, vegetation, and green areas purify the micro-climate. They increase the proportion of oxygen in the air and decrease the amount of carbon dioxide through the process of photosynthesis. One study has found that one acre of a variety of plants

may provide enough oxygen for 18 persons (Kelly et al., 1976). Trees and vegetation also can absorb sulphur dioxide (SO2), carbon monoxide (CO), and many other dangerous gases which are emitted by automobiles, machinery, and factories, and can reduce the level of undesirable sound.

Table 7.3 in Chapter Seven shows the loss of agricultural land now under concrete in the process of development in the oasis. Losing the trees in the oasis has a detrimental environmental impact in a country like Saudi Arabia, which is hot and arid, as the trees in general help in protecting the settlements in oasis areas from the hot weather, polluted air, and wind erosion.

8.3 Analysis

8.3.1 Urban, Environmental, and Agricultural Policies

8.3.1.1 Urban and Physical Development Planning Policies

The previous five Five Year National Development Plans (NDPs) and the current sixth plan have emphasised development and the completion of the infrastructure throughout the country 'to complete infrastructure projects necessary to achieve overall development' (MOP, 1995, p. 88).

Although such infrastructure development was intended to be wide-ranging and to encompass not only industry but also recreation, agriculture, and residential matters, it has nevertheless been industrial-urban development which has in reality been favoured. In the Eastern Province, where Al-Qatif oasis is located, infrastructure development was particularly meant to serve the interests of the growing oil industry. Widespread development of highways, opening up and connecting areas of oil exploration, extraction, processing, storage, and distribution took place. Development of secondary and local roads, provision of water, electricity, and telephone networks, health services, education services, and recreation services followed, which together have greatly improved the quality of life in the Al-Qatif settlements. These advances, however, have also exposed them to the pressures of urban development as described

in Chapter Seven and indicated in Figures 7.5 and 7.6. Although these great efforts have been made by the government to provide the best for the Al-Qatif oasis in terms of transport, education, health, and recreation development, much of this has taken place on what was once agricultural land.

One of the most striking features is the new corniche driveway, which links the Al-Qatif oasis and its settlements with Dammam and the rest of the Eastern Region (see Figures 7.4, 8.1, 8.2, 8.3, and 8.31). The corniche driveway obviously exerts yet more urbanisation pressure on the oasis and its settlements. For example many people, not only inhabitants of the Eastern Province but people from all over the Gulf area and the Kingdom, use the driveway to get from Dammam to Khobar, to Jubail, or to the oasis. The corniche recreation area is a favoured spot for people from the whole of Saudi Arabia, and it has attracted many visitors, whose vehicles contribute to the air and noise pollution suffered by the inhabitants of the oasis settlements. The corniche recreational area has in effect become a physical barrier between the oasis settlements and the coastal line, previously readily accessible to each other. This huge project has been developed on land reclaimed from the sea, and there is an urgent need for its impact on the environment to be assessed (see Chapter Seven).

Improvement of the road system has been an objective of the Saudi development plans, the primary goals having been to link the major settlements with a network of main roads and to connect rural areas to that network. (MOP, 1995)

Figure 8.30. Panoramic view showing the Dammam - Jubail highway, which offers ready access to the Al-Qatif oasis and which connects Al-Qatif oasis to the other cities in the Eastern Province.

The improvement in the transport system has greatly increased the mobility of the population and has contributed to the growth of the built-up area because of the

importance of Al-Qatif oasis in the eastern part of the country. It is important as an agricultural producer and it occupies a key location between two of the kingdom's most important cities, Dammam and Jubail..

Al-Qatif oasis and its settlements are therefore served with a good transport system, but the development of this system has taken place for the most part on agricultural land and land reclaimed from the sea. The agricultural areas also were subject to the cutting down of a large number of palm trees to make way for features of the social and physical infrastructure. The infrastructure network also meant that built-up areas were segmented, being separated from each other by wide roads and by conduits for other services, replacing traditional buildings. In the coastal areas hundreds of hectares of *sabkhah* and mangrove swamps were filled in to provide space for residential subdivisions and their required services. This has led to dramatic ecological change in the oasis and has altered permanently the features of the landscape (see Figures 8.17, 8.19, 8.20, 8.21, 8.23, and 8.24).

Transport and road development has also opened up frontiers and virgin lands for exploitation, and natural areas with their delicate ecosystems were invaded by tracks and four-wheel-drive vehicles (see Figures 8.33 and 8.34).

Figure 8.31. Panoramic view showing the entrance to Al-Awjam with the connection to the highway, which encourages movement of population to and from the settlement.

Figure 8.32. One of the Al-Qatif oasis main roads which connect together some of Al-Qatif oasis settlements, such as Al-Khwaildia, Al-Qatif, Al-Jarudia, and Hillat Muhaish. The road goes through agricultural land.

The most significant sources of pollution related to the urban-industrial areas of the oasis, located as they are between the major cities of Dammam and Jubail, are fossil-fuelled power plants, cement plants, fossil-fuelled desalination plants, refineries, gas/oil separation plants, sulphuric acids plants, mineral processing plants, chemical plants, and motor vehicles (MEPA, 1986, Part 1) (see Figure 7.3).

The shift from a rural to an urban way of life has been taking place at remarkable speed, particularly during the years of economic boom commencing in the early 1970s, as explained in Chapter Three. Small settlements have grown enormously to reach metropolis size.

In addition the increase in urban population and the growth of urban centres is a result of huge investments in socio-economic programmes, the building of infrastructure elements, the construction of health and education facilities, and the introduction of local industries, creating more opportunities for employment and improved amenities and services (see Chapter Three for details).

The discussion in Chapter six introduced the main MOMRA policies, programmes, and objectives in the National Development Plans; they consist of many activities related to physical planning development and the protection of natural resources. One of MOMRA's stated objectives in the National Plans is 'to maintain land, natural

resources, and environment and utilise them for future generations' (MOP, 1990, pp. 375-376).

In addition, the Sixth National Development Plan states amongst its objectives:

> to maintain the improvements in the general living circumstances of the Saudi citizen countrywide, in terms of health and environmental matters , and to play a full part in the successful accomplishment of infrastructure objectives needed by other government ministries to carry out their development tasks. (MOP, 1995-2000, pp. 375-387)

MOMRA plays a very important role in physical planning development and in planning at the central level. MOMRA is responsible for the physical planning of cities and the provision of roads and utilities, health services, and the administration of city amenities, such as the general appearance and cleanliness of cities. MOMRA administers preliminary surveys to prepare development plans, carries out the actual preparation of development plans at all levels, assesses city plans to ensure conformation to regulations, prepares planning standards, and prepares, approves, and implements plans.

To implement these plans and programmes the government has established municipal classification from central to local level with different municipal categories, as explained in Chapter Six, Section 6.2.3. Table 6.1 shows the number and classification of municipalities.

There has therefore been a very obvious physical development in all the Kingdom's cities and villages and a clear improvement in many features (see Chapter Two). However, the changes have had a general environmental impact in all Saudi communities. One consequence has been the loss of the agricultural land of the oases at local level. It has been noted when reviewing MOMRA's objectives, policies, and programmes that one of its objectives, in addition to having responsibility for physical development, is the development of land regulation and the control and protection of natural resources. Further, it is stated that planning for urban development, whether at national or local level, should be carried out in collaboration with other bodies in the policies of the Sixth National Development Plan. It seems, however, that objectives,

policies, and programmes have not been implemented with the required degree of collaboration in the case of Al-Qatif oasis. Development has taken place without due regard for the natural resources of the oasis.

One official working in the Al-Qatif municiblity supports this by stating:

> As one of the people involved in working in Al-Qatif municipality, I see the change of agricultural land to residential planned areas. This has resulted because of the physical obstacles in the oasis, that is the sea from the east, and agricultural land from west. I think there must be alternative to this invasion of the agricultural land offered in a more serious way by the Ministry of Agricultural and Water and the Ministry of Municipal and Rural Affairs. (Interview/Questionnaire survey 1997-2000).

Figure 8.33. Panoramic view showing the invasion of physical development in the form of streets, and commercial and residential buildings, over available resources (the agricultural land of the oasis).

In order to ensure a high quality of urban development as envisaged in the National Development Plans the municipality responsible for the development of Al-Qatif has prepared plans, programmes, and objectives and then carried out the development in the oasis with the result that the various settlements of Al-Qatif oasis have changed in nature. From an oasis with its settlements and scattered villages and other surrounding settlements as it was in the 1950s Al-Qatif and some other communities became modern cities, and urbanisation in the other inhabited places round about followed (see Chapter Seven). The population growth meant an increase in demand for public services and facilities, and the municipality provided the services and the land for it. As the population increases yet more, either naturally or through immigration, so the demands for services and facilities will increase further. The outcome of all this has been a tremendous use of land that would otherwise have been untouched for the provision of roads, paths, and services conduits.

Concerns such as the changing pattern of urban form, the growth and distribution of the built environment, the degradation of the quality of the air and water, the fate of the agricultural land of the oasis, physical and urban waste, the aesthetic appearance of the city, and so on are highly dependent upon the interaction between economic and environmental elements at national, regional, and local level. Therefore it is necessary to examine the issues of sustainable development and planning at the level of Al-Qatif oasis in relation to the functions of MOMRA.

Al-Qatif oasis is under the responsibility of a municipality with the functions explained in Chapter Six, Section 6.7, i.e. data gathering, the preparation of master plans and action area plans, the preparation of land subdivision, advising local authorities and private developers on the location of major projects, the co-ordination of planning and development at regional and local levels, and providing input for the preparation of national plans (see Table 6.2, which shows the municipal functions).

It is plain that the urban expansion into agricultural land that has occurred in the Al-Qatif oasis has been directly or indirectly the result of the actions of the municipality's planning department. An examination of Table 7.2, showing the growth of Al-Qatif oasis and its settlements, and of Figures 7.5 , 7.6, and 7.7, showing the change of land configuration in the oasis and its settlements, makes it clear that there has been no attempt whatever to preserve agricultural lands.

In addition most of the fieldwork survey carried out with officials working at the municipality in the case study area shows that the loss of agricultural land in the oasis is a result of the planning, policies, and standards which were inadequate and unspecific at national level, as has been indicated in Chapter Six. At the central level (MOMRA) the Deputy Minister for Municipal and Rural Affairs has supported this by stating:

> The rapid urban growth and the difficulties of applying the past planning studies, which feature certain economic and social factors, in such a way as to provide the right planning policies in general and building regulations in particular, has resulted in the building regulations in all of the Kingdom's cities being the same. This does not take into consideration the different social, economic, environmental, and

> topographical factors for each city. (Al-Jazeera newspaper, 1998, p.5)

In addition, an official at Dammam Municipality Department of Planning states:

> We need to establish national strategies to control the agricultural area and the coastal area which include environmental standards and studies which take into consideration Al-Qatif oasis's natural resources. (Interview/Questionnaire survey 1997-2000)

He adds:

> There is a lack of special studies and information about the soil and underground water pollution in the oasis to enable us to understand the level and impact of pollution and to establish a plan to solve the problem. (Interview/Questionnaire survey 1997-2000)

At the same time interviews with the residents in Al-Qatif oasis settlements show that the municipality officials have done their best to enhance the quality of life in the urban development of the oasis and its settlements. However, in practice they have destroyed their cultural, social, and economic values. One resident states: 'I used to walk from one village to another through a nice green countryside environment. Now I have to use the car with air conditioning.' (see Figures 8.36 and 8.39).

Others argue that it is good to have a good quality of life in the oasis: new, larger houses instead of houses too small for all the family members and large farms with inadequate production. However, this shows the level of understanding of the future demand for agricultural land for other uses (see Figures 8.37, 8.36 and 8.38).

The general residence picture is that before the discovery of oil Al-Qatif oasis and its settlements were compact, as the majority of the male population worked in sea fishing and pearling or cultivating the agricultural land, while the women and children gathered in public and semi-public places between houses participating in traditional social activities. However, after the discovery of oil many social and economic changes took place rapidly: people left their traditional jobs for more profitable occupations and changed their accommodation expectation in the light of the new

planning standards. Many people, for example, who worked for Aramco were encouraged by loans to replace their traditional houses with villas. All of this played a part in the destruction of the landscape and the natural resources of the oasis, and in the availability of urban spaces for traditional communal activities (see Figure 8.34).

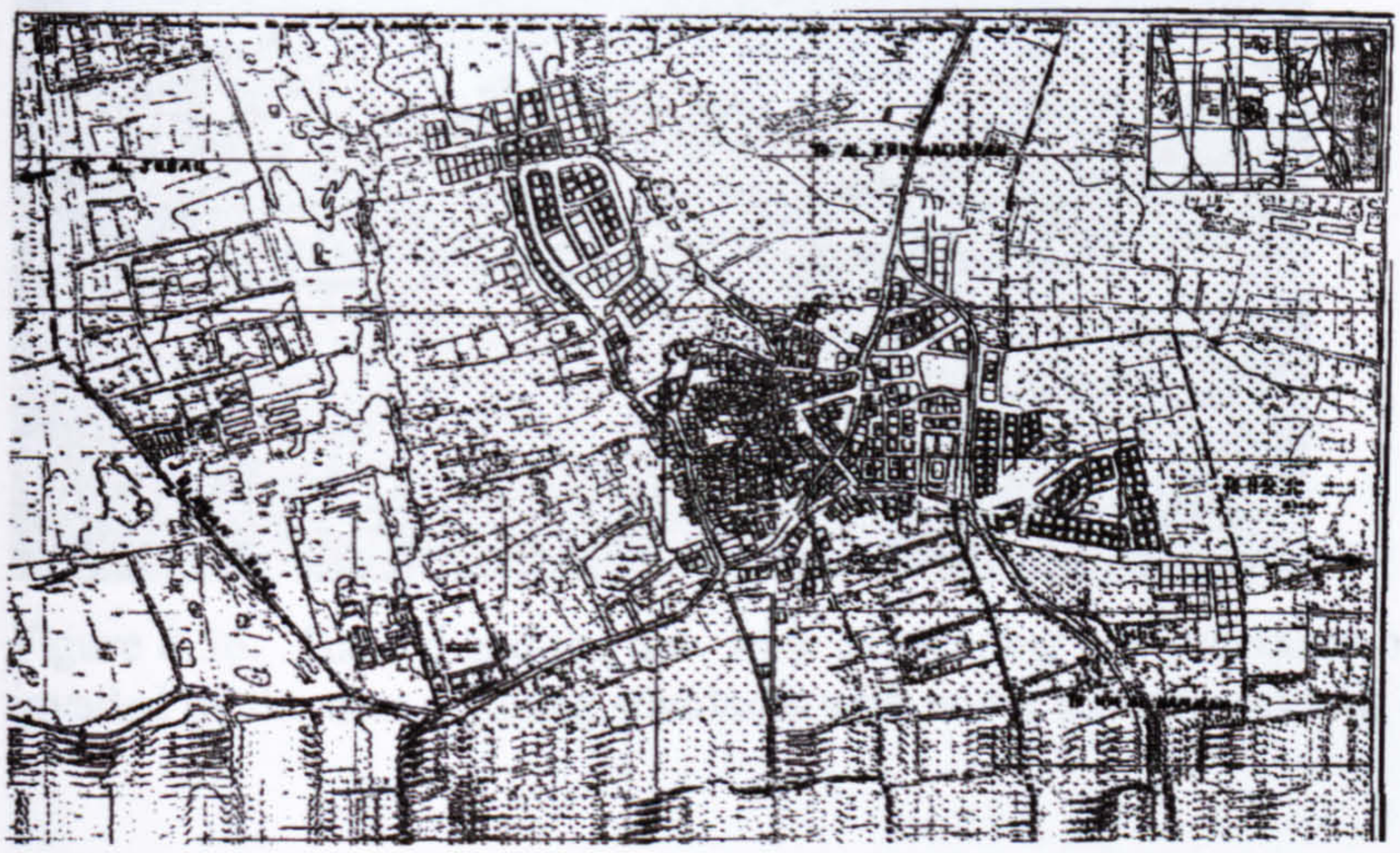


Figure 8.34. Jarodia village.
Source: Al-shihri, 1994.

This shows the example of Al-Jarodia, one of the settlements of Al-Qatif oasis. The expansion of the village into agricultural land is clearly indicated, allowing a comparison of the old and the new planning practices in the village. The built-up area in the centre is the old type of compact traditional environment, and the areas with wide streets and villas are the new areas.

Figure 8.35. the old houses type started to go down, where new houses type is going to be built in the near future, using more land.

Figure 8.36. The old and the new style of planning and practices: old small housing invaded by the new planning standards with wider streets, and villa type housing.

Figure 8.37. The new housing planning standards: wide streets, parking, and villa type housing, which has taken up more of the natural resource land of the oasis in Al-Qatif city.

Figure 8.38. Current housing and planning standards practises in the Al-Qatif oasis: parking areas, areas for planting, and a large amount of land used up for a villa type house on the agricultural land in Sihat city in Al-Qatif oasis.

Figure 8.39. Panoramic view showing the general combination of the old housing type, the new housing type, the destruction of the agricultural land, and the invasion of cars.

As explained in Chapter Seven the municipality, in order to provide a good quality of urban development in the Al-Qatif oasis and its settlements, has applied new density standards while subdividing new areas and approving new developments, which are quite generous compared to the previous density standards (see Appendix II). This has inadvertently used up more land than necessary. Land has also been used at a higher rate by roads and paths conforming to modern planning standards than by roads and paths existing previously. All of this has radically altered the traditional built environment and landscape of the oasis (see Figures 8.36, 8.37 and 8.38).

The spatial planning of the cities, towns, and village clusters as well as the provision of infrastructure and the maintenance of public hygiene and safety are the policy instruments through which the Kingdom's urban sector makes a contribution to national and regional development. In the country there are five super municipalities

(*Amanat*), 96 municipalities in various categories, and 43 village clusters. These agencies have comprehensive urban, regional, and rural plans which conform to the stages of the Five Year National Development Plans. This approach enhances the planning of national and regional co-ordination and ensures that investments in municipal infrastructure and services act as a catalyst for local development. Other instruments included in the master plans are land use, zoning, land subdivision, development control regulations, and specific action area plans (Al-Hathloul and Anis-ur-Rhaman, 1985; Al-Hathloul and Edadan, 1993) (see Figures 8.33, 8.35, and 8.38).

It would appear that the comprehensive urban and rural regional plans were not guided by sufficiently comprehensive, specific, and explicit sustainable urban, rural, and regional objectives. Nonetheless, such objectives can be included in the preparation and decision making governing the production and implementation of future plans.

As an example attention may be drawn to the lack of planning studies and planning standards for environmental assessment in the oases, as explained in Chapter Six. The planning studies done in the Al-Qatif area make up the master plan of Al-Qatif and its urban growth boundary (UGB). Al-Robia'an, an official of the Dammam municipality supports this by stating:

> All the oasis settlements do not have a master plan or any strategies for development. Decisions on land uses and development are taken when necessary according to the planning features that emerge from the guided physical growth without consideration for any other planning aspects. (1994, p.67)

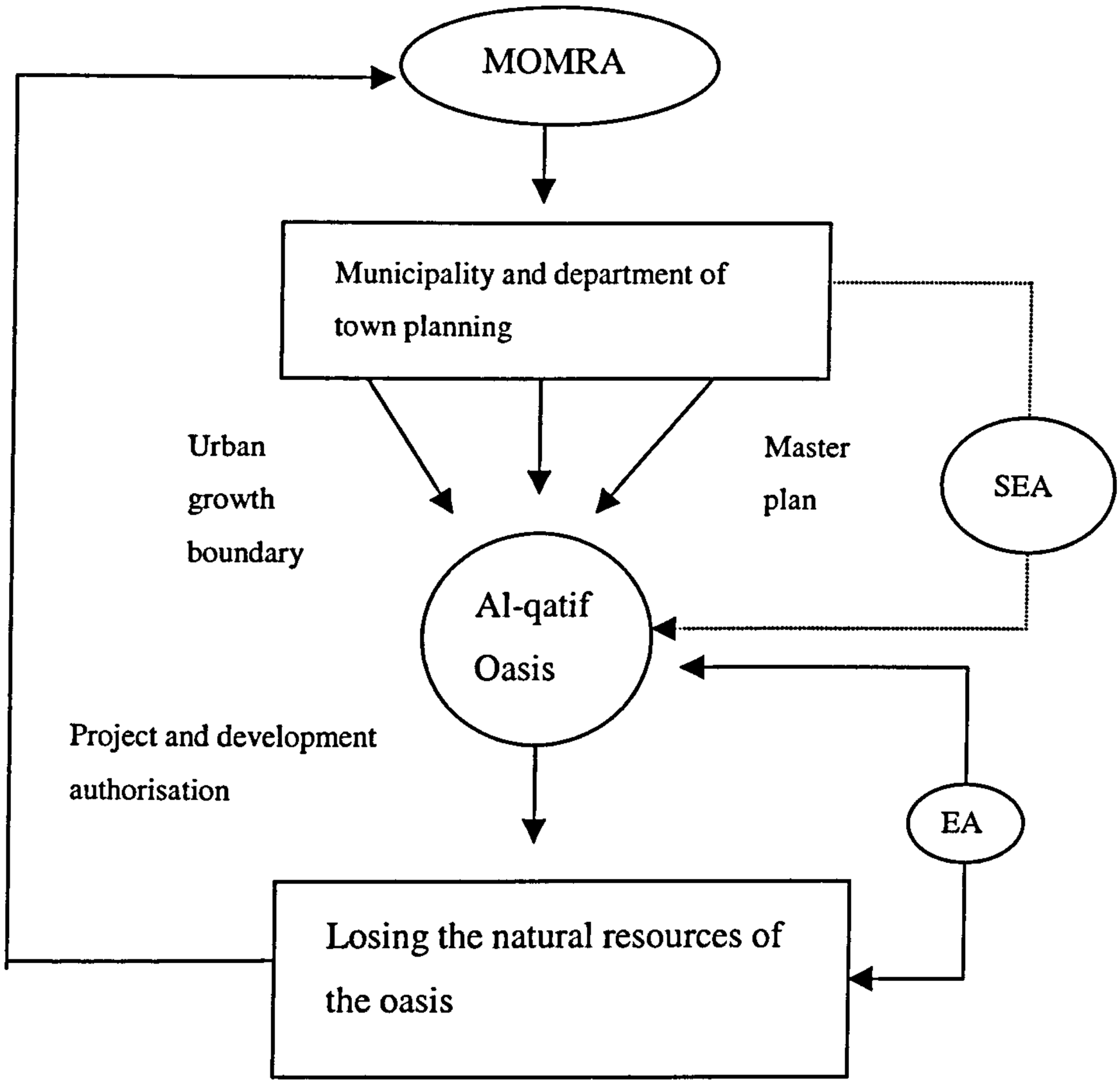


Figure 8.40. General view of the development path in Al-Qatif Oasis.

It is clear that Al-Qatif oasis and its settlements have been treated like all other cities, without consideration of their location features, such as agricultural land, in respect of their development. An official at Al-Qatif municipality explains:

> As far as what is happening in the oasis is concerned, environmental planning, policies, plans and programmes are just theories unless they are implemented in real life. (Interview/Questionnaire survey 1997-2000).

Through the review of the planning studies carried out it Al-Qatif oasis and its settlements in Chapter Seven it is clear that the planning process has lacked the implementation and the application of environmental assessment of plans, programmes, and policies of any projects in the oasis. This is despite the fact that it states in the plan objectives produced by the government that it should act

> taking environmental consideration into account in the various stages of development projects (i.e. planning, design construction, operation) in all sectors, especially the producing sectors of agriculture and industry, whereby all projects shall be subject to environmental impact assessment. (MOP, 1995, p. 410)

In the course of the field survey conducted with Al-Qatif's Planning Department one official stated, when asked about the environmental considerations taken during the planning process:

> It is very important to do environmental assessment for any plan, policy, or programme, and the municipalities do environmental assessment but in general, but not in a detailed way. (Interview/Questionnaire survey 1997-2000)

> Another official said: 'I think it is important to do environmental assessment. However, there are no procedures in place to apply environmental assessment in the planning process.' (Interview/Questionnaire survey 1997-2000)

These views were echoed by most of the planners consulted.

In addition there has not even been any verbal discussion of planning policies at the national or local level concentrated on the oasis; the oasis has, however, been mentioned in general outline at the national level as stated in Chapter Two.

This has been borne out centrally by MOMRA, which indicates that environmental problems such as pollution, noise, the loss of natural resources, and the ongoing growth of the built environment in the settlements have resulted because there has not been any clear national concern for an environmentally sustainable development strategy for the settlements (MOMRA, 1992).

This has been confirmed by an official Amant Al-Dammam, who states:

> There are no clear strategies and policies in relation to sustainable development, and there is a need to study and evaluate the existing situation of renewable and non-renewable natural resources to establish a comprehensive plan

> to manage the natural resources of the oasis which will provide the balance between the needs of the existing generation and the needs of the next generation. (Interview/Questionnaire survey 1997-2000)

Al-Qatif master plan and the UGB of Al-Qatif oasis and its settlements did provide guidelines for development (Chapter Seven), but there was not much stated about the impact of this development on the physical and ecological aspects of the oasis and how to manage it. For example, the master plan of Al-Qatif (1976) aimed to preserve the natural environment and agricultural character of the area, and within the framework of the regional plan and development programme the intention was for the area of Tarut island and Al-Qatif to stay as they were as far as possible. The oasis was to be preserved and at the same time expanded by all possible means, and the small towns in the area were to be extended mainly towards the sea on reclaimed land, without causing damage to the green areas of the oasis (Al-Qatif Master Plan, 1976). In addition the master plan proposal was quite generous. Land has been used at a higher rate by the social and physical infrastructure. The proposal has altered the traditional built environment and the landscape. The proposal further aimed to protect the green area and expand towards the sea on reclaimed land. However, expanding towards the sea has affected the agricultural and green areas in an indirect way in that they have attracted so many activities to the coast region and this, as we have seen, affects the oasis. One factor that has contributed to this situation is the fact that preliminary studies failed to indicate the importance of providing environmental impact information about the area in the process of preparing plans to reclaim land from the sea.

Another study was that done in 1977 on the UGB of Al-Qatif oasis and its settlements, as discussed in Chapter Seven. The Council of Ministers resolution No. 1170 asked for the establishment of UGBs for towns and cities for the following 20 years. Accordingly MOMRA directed municipalities to prepare detailed studies covering existing conditions, as well as development plans and projects, and to submit these UGB studies to DMTP. In 1989 the Council of Ministers approved UGBs for 100 cities and towns, comprising (1) first phase UGB, (2) second phase UGB, and (3) a

protection zone. The stipulations attached to the UGBs are laid out in Chapter Seven, Section 7.9.2.

The goal of UGB was clear. It was to control urban growth, especially random growth, checking urban sprawl and rationalising infrastructure use and operation (Urban Limit Growth of Al-Qatif Oasis, 1989). It is obvious that the understanding of the demarcation of UGB at that time was rather simplistic in that it did not require the definition of physical boundaries to urban growth to take regard of the need for development control. As such the allowance for the physical expansion of the oasis settlements was far too generous. About 5,059 ha. were earmarked for the first, second, and third phases. According to the UGB study it was intended that the first phase would last from 1990 to 1995, the second phase from 1996 to 2000, and the third phase from 2001 to 2005 (MOMRA, 1989).

The objective, as spelled out by the central government, was the containment of urban growth to maximise the use and rationalise the provision, maintenance, and operation of public utilities. In theory the establishment of UGB provided a tool for controlling urban growth. However, in reality no specific provisions were made regarding the control of the rate, and direction of growth. It is clear that UGB was not viewed as a measure to protect agricultural land, as no specific mention was made regarding the protection of the oasis (agricultural land). There were no special directives for the oasis settlements, so that it appears that these were to be treated like all other developments in respect of land development (see Figures 8.42, 8.43, and 8.44).

Two contrasting answers are given by respondents to the researcher's fieldwork survey on the question whether planning standards applied to agricultural areas differ from those applied to cities. Some respondents indicate that the difference in character between cities and agricultural areas are indeed taken into account in the planning and developing of oasis land; others indicate just the opposite. In reality it appears that no special consideration has been given to oasis areas, as an examination of the cases of Al-Qatif city, Sihat, and Anik shows. These were all small villages in the past but now they are large cities (see Appendix II).

In addition, the researcher learned through the interview field survey with members of the public in the Al-Qatif oasis settlements and with staff in property offices that Al-Qatif oasis and its settlements have changed completely in every aspect - socially, culturally, and physically.

Land use planning as carried out by the municipality promotes the loss of agricultural land, as we have already noted. The area's master plan and UGB were developed on the basis of economic considerations, and even from the objectives of the studies before any development actually took place, it can be seen clearly that the natural assets of the oasis and non-renewable resources (agricultural land) would be lost. When assessing the previous studies carried out by the municipality the master plan for Al-Qatif proposed development towards the sea; the result is the destruction of the natural resources of the sea. There are also other associated problems: it is, for example, very costly to construct any project in land reclaimed from the sea in terms of material and maintenance (see Figures 8.45, 8.46, and 8.47).

Abu Al-Khil (1979) argues that planners should give first consideration to agricultural land areas as they are considered excellent examples of prosperity and welfare; agricultural land is the backbone and foundation of the economy in all countries. He concludes:

> Rural planning is different from urban planning in terms of one basic element i.e. the consideration given to the importance of cultivated areas and their protection from development effects, and even the formation of development in accordance with the desire of the population and in conformity with their environment. (p.87)

This, however, is not the case in Al-Qatif oasis, where planning studies such as the UGB made proposals for the future expansion of Al-Qatif oasis and its settlements. The proposed expansion was to develop the vacant land in each city and settlement within each boundary. What actually happened is that the expansion led to the joining together of the various communities (see Figures 7.5 , 7.6, and 7.16).

The planning standards dealing with density and building height have allowed 94 percent of the built-up area to be covered with two storey buildings, leaving only 6

percent with buildings of three or more storeys. There are no buildings more than seven storeys high. This low-rise villa type of building will increase the loss of cultivated agricultural land, using up more land for dwelling houses than would have been the case with traditional buildings. Population distribution is also uneven, the density varying as indicated in Table 7.2, and in some settlements with a high density the demand for housing means that, in order to comply with existing standards, the only way to expand is over agricultural land (see Figures 8.37, 8.38, and 8.39).

Figure 8.41. A block of new housing of the villa type in Sihat city, showing the existing planning density practices in the oasis in general with houses of one and two storeys high. These occupy more originally agricultural land of the oasis.

Figure 8.42. A planned area after it has had its intended use changed and become a residential planned area.

Figure 8.43. Panoramic view showing the huge amount of agricultural land converted to residential planned areas in Al-Qatif city.

Figure 8.44. Panoramic view showing a large tract of vacant land formerly of agricultural value, and now used for the disposal of waste, garbage, and unwanted construction material.

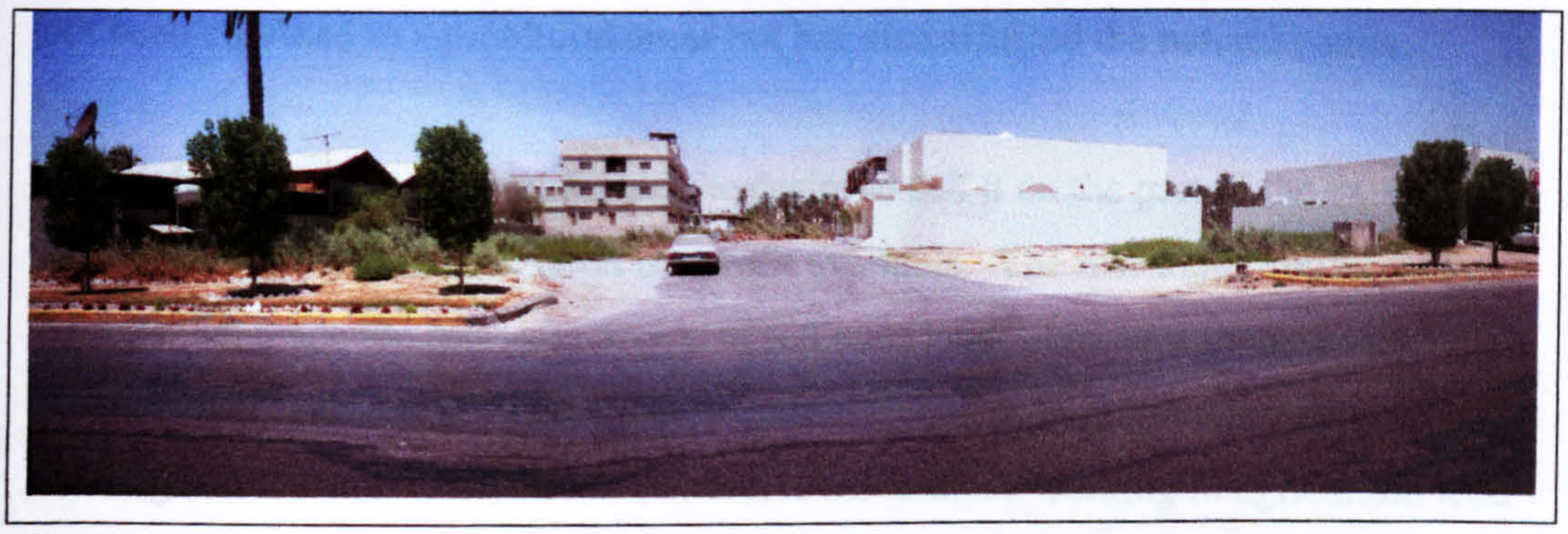


Figure 8.45. Panoramic view showing a development with houses of the villa type and wide streets, using up more agricultural land .

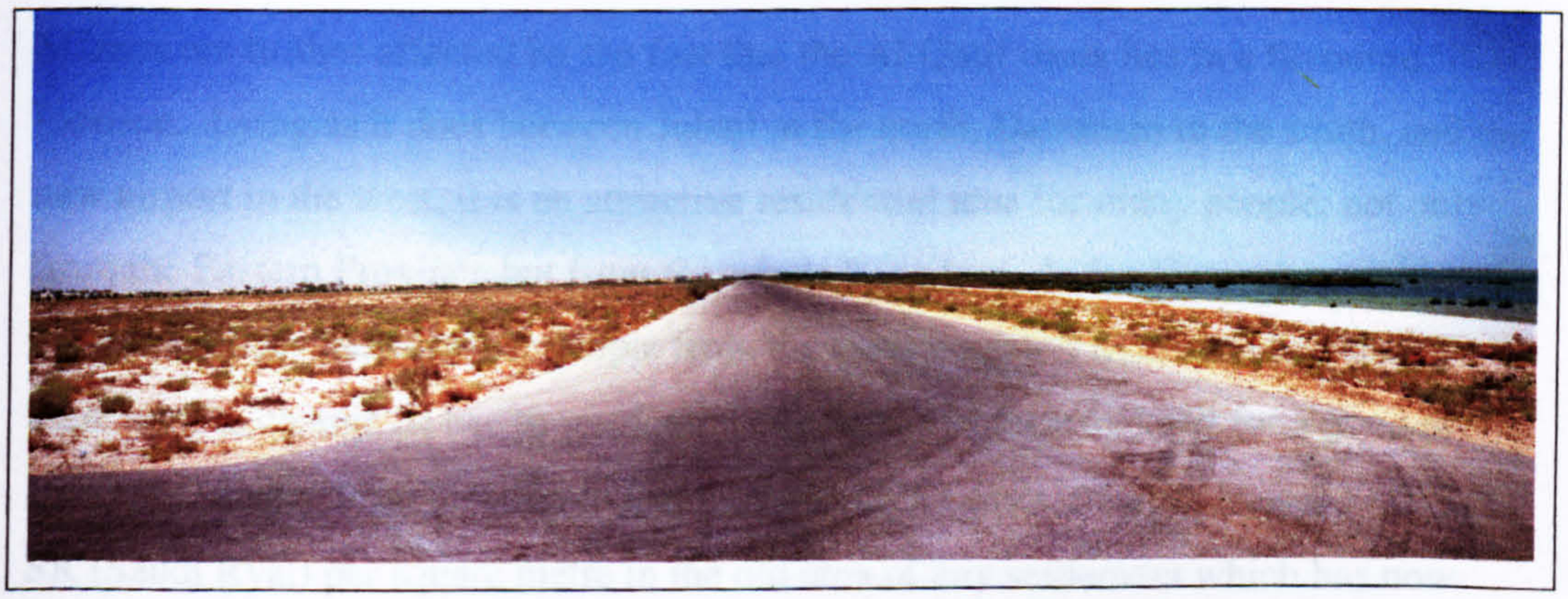


Figure 8.46. Panoramic view showing a large amount of land reclaimed from the sea. The area is the subject of planning for comprehensive development in the near future.

The existing direction proposed by the planning studies (UGB) in the oasis indicates that the settlements are merging into each other according to the subdivision planned by the municipalities, and this will cause the oasis settlements to merge into one urban mass. The character of the oasis will be lost forever (see Figure 7.16).

Al-Qatif oasis and its settlement witnessed rapid urban growth of the sort that has been typical throughout the Kingdom during the last three decades (see Figure 7.4). Because of the unique natural features of the region, characterised by coastline on one side and agricultural land on the other, urban expansion has drastically affected the agricultural areas. Adding to the problem is the neglect of agriculture by the local people in favour of industrial and commercial activities. The people have been unaware of the long term repercussions of such trends. Furthermore, this process has not been confined to agricultural areas but has also affected the natural coasts.

The high price of land has increased the desire to sell it on the part of the existing landholders in order to cash in on the profit available. The researcher found many reasons that made the residents decide to sell their land. Amongst them are the possibility of both government and private sector jobs providing more income than farming (see Section 7.7.1). Furthermore, loans to those working in agriculture tend to concentrate on those involved in large-scale agricultural production rather than in small farms.

Matters are further affected by the fact that the Al-Qatif oasis lies in a favoured location. Lying as it does between Jubail in the north, Dammam in the south, and the new airport in the west, it is an attractive residential area for many people, not only from the Eastern Province but from the whole Kingdom. Indeed interviews with property offices indicate that people from the oasis have left their land because of their wish to change its use to residential or commercial use and sell for a good profit. Land prices vary from location to location within the oasis, ranging from 200 to 5,000 SR (Saudi Ryal) per square metre in the old area of any settlement which has now been provided with all the necessary infrastructure.

An examination of Chapter Six, especially Sections 6.3 to 6.6., will demonstrate that, in the provision of land, the improvement of land, and the construction stages, there have been no clear and specific policies or requirement by the municipality to submit any studies related to the environmental impact of the development or projects planned for the oasis. This increases the problems in the oasis.

The municipality has no specialised department on environmental studies and data beyond the Department for Environmental Health to monitor and review plans and the impact of plans, policies, and programmes on the natural resources of Al-Qatif oasis. From an examination of Table 7.1 (population growth in the oasis) and Table 7.2 (population density in the oasis), based on work carried out by the municipality (Planning Department), the rate of population has increased during the past three decades and at the same time the population has become concentrated on the area surrounding agricultural land. Future projections on population, if accurate, mean that there will be insufficient land, and what land there is will be on what is now agricultural land or land reclaimed from the sea.

A further point is that, although the increase in the population of the oasis, its favoured location in relation to Dammam and Jubail cities, the appeal of the corniche as a recreational area, and the opening of the new airport will all work to attract employment to the oasis and its surrounding area, this will also mean further danger for the oasis in that more agricultural land will vanish under pressure of the demand for residential, commercial, and industrial development.

In general urban and physical development have been characterised by a lack of comprehensive plans, policies, and programmes at the national level which could be applied to the sustainable development of Al-Qatif oasis at regional and local level. This can be clearly seen through the way that the municipality, when planning the oasis development, has had to act without the advantage of full and up-to-date ecological information about the oasis. There has also been a lack of environmental impact studies, such as environmental assessment of plans, policies, and programmes, in relation to Al-Qatif oasis and its settlements. There has been no appreciation of the

importance of natural resources, in the form of agricultural land, as a feature of economic significance for the present and for future generations.

8.3.1.2 Environmental Policies

The rapid population increase in the Kingdom of Saudi Arabia in the last 30 years has caused a rise in the number of urban centres which had a rural origin, and this has led to environmental problems as indicated in Chapter Three. In the country in general and in Al-Qatif oasis in particular the changing pattern of urban form, the growth and distribution of the built environment, the degradation of the quality of the air and water, the loss of agricultural land, and the increase in the population have caused a growth in commercial, industrial, and residential activity. This growth has been largely uncontrolled.

The government therefore took the initiative and established a basis for environmental programmes and regulations, and set up the various ministries, institutions, committees, and other bodies for the application of its environmental policies, as reviewed in Chapter Four.

The review of the environment policies, regulations, and programmes given in Chapter Four shows that the desire of the government was to achieve sustainable development as a matter of the greatest concern in Saudi Arabia. High priority was given to the protection of the country's natural resources and to finding a balance between development and the environment. However, the policies and programmes are still general and pertain to the national level. No specific policies have been identified which are aimed specifically at the protection of the agricultural land of Al-Qatif oasis.

One of the basic strategic principles of the Sixth Development Plan (1995-2000) was devoted to environmental issues. It proposed to preserve and enhance the natural environment and prevent pollution by implementing the following policies:

1. Protecting the environment and preserving its natural characteristics, in addition to conserving natural resources.

2. Protecting and developing wildlife in Saudi Arabia, together with preserving the natural equilibrium of its ecology in terms of the genetic diversity of its zoological and botanical make up.
3. Maintaining continued equilibrium with regard to the most suitable population distribution and environmental integration, taking into consideration the impact of population growth and consumption patterns on natural resources (MOP, 1995).

In addition, as reviewed in Chapter Four, the environmental policies of the Sixth Development Plan did not indicate the need for strategic environmental assessment (SEA) in relation to national, regional, or local policies, programmes and plans. This has increased the problems of losing the valuable natural resources of agriculture land in the oasis.

It should be noted that, as discussed in Chapter Four, there is a great range of environment policies identified by the Five Year Plans, especially the sixth and fifth plans, and other documents which relate to urban and physical land use planning and management. These include the National Report to the 1992 Rio UN conference on the environment and development, and Agenda 21 Saudi Arabia. There was, in other words, awareness at national level of the problems to be taken into consideration.

Despite the abundance of environmental plans, policies, and programmes at national level, as indicated in Chapter Four, it is clear that there has been a lack of specific policies in relation to the protection of the agricultural land of the oases. According to the review of the environmental ministries, agencies, and committees responsible for environmental protection the bodies with the greatest responsibility in this area are the Ministerial Committee for the Environment (MCE), the Meteorology and Environmental Protection Agency (MEPA), and the National Commission for Wildlife Conservation and Development (NCWCD). These bodies operate, however, at national level, and, as we have seen, there is no requirement from them for any study such as an environmental impact assessment (EIA) or SEA to be carried out before a local project is approved. At the local level of MOMRA there has been no clear strategy to translate the plans, policies, and programmes of these bodies into effective action in regard to cities and settlements, including Al-Qatif oasis.

This has been borne out by the planners working at the planning department in the municipality and involved in the development planning of Al-Qatif oasis.

One official states:

> Environmental policies and plans and regulations which exist are not enough and there is a need for local plans, programmes and policies to manage and protect the oasis. This should include implementation mechanisms, which require the co–operation and integration of other responsible government sectors. The aim should be to provide the balance between urban development and the protection of the oasis, to achieve sustainable development in the oasis. (Interview/Questionnaire survey 1997-2000).

Another official states: 'The environmental policies need a operational system and need to be integrated with comprehensive environmental planning strategies.' (Interview/Questionnaire survey 1997-2000).

Yet another official states:

> The existing environmental policies do not reduce or stop the loss of the natural resources of the oasis and the change of its natural resources such as agricultural land and its general relation to other uses. This requires an implementation system, linked to the existing development processes. (Interview/Questionnaire survey 1997-2000)

Moreover, the case study survey shows that there is no basic database information about the environment and natural resources of the oasis in detail introduced by the responsible agencies to be used or taken in consideration while planning for development in the oasis. Studies by the agencies responsible, such as Agenda 21, have indeed taken place into the state of the environment, but these are not comprehensive and have not been updated. Furthermore there are no agencies within the case study area, whether in municipalities or in sub-municipalities, which are responsible for the study of environmental data. Indeed there are insufficient staff in municipalities and sub-municipalities who are specialised in environmental planning studies, so that it would be difficult to find the personnel qualified to carry out such

studies. Most municipality and sub-municipality staff are physical planners, architects, civil engineers, and so on, and they do not have training in EIA, SEA and other environmental planning study techniques.

Policies relate to the general environment and the protection of natural resources, but these have not yet been applied. There are, for example, studies identifying sensitive areas where natural resources and the environment should receive special attention. And in the case of Al-Qatif oasis and its settlements, even although it is located in an ecologically sensitive area, there is a lack of studies, whether of a quantitative or qualitative type, on its natural and ecological resources, which could help planning for current and future physical activities in sustainable way. This has increased the damage and the problem of losing the natural resources of the oasis.

8.3.1.3 Agricultural and Water Development Policies

Our review of agricultural and water policies (Chapter Five) through the period of the Five Year Development Plans shows that, with the emphasis placed on the development of agriculture and the qualitative improvement of natural resources throughout the entire period, due attention has been paid to agricultural and rural development in the national plans. Even this, however, this has been largely irrelevant to the needs of smallholdings, which is the typical farming pattern in the Al-Qatif oasis.

The Fourth Development Plan, as indicated above, stressed agricultural development and qualitative improvement, stating: 'Various types of financial loans will be provided to meet the needs of both the small farmer and the large-scale operator.' (MOP, 1985, p. 194) In addition, the Fifth and Sixth Plans, in relation to agricultural development, laid emphasis on large-scale projects, stating that the objective was

> to increase and diversify agricultural production through the application of large-scale production technology that utilises renewable water resources and modern irrigation methods most efficiently. (MOP, 1995, p. 215)

This had a negative effect on the development of agricultural land in Al-Qatif oasis, because the policy of supporting large-scale schemes meant a neglect of the requirements of smallholders typical of the oasis area. This meant, apart from anything else, that there was little incentive for the small farmer to stick to agriculture. The option of earning higher returns from what had been agricultural land by converting it to urban residential use became increasingly attractive and contributed to the decline of agriculture. This has been supported by an official in the Ministry of Agriculture and Water, who states: 'The agricultural land can be preserved and protected through supporting the farmers by providing them with equipment and technology to cultivate their land.' (Interview/Questionnaire survey 1997-2000)

One estate agent explains that with modern life people want new houses and new cars. People's expectations have changed, and those who work in agriculture now prefer to be involved in government sector jobs or to work for a private oil company, as these provide more money than the agricultural sector. This has been confirmed by an official in Al-Qatif Municipality, who stated:

> I work in Al-Qatif Municipality which is one of the few oases in the Kingdom, and I see everyday the continuous destruction of the agriculture land and its change to residential, commercial, and industrial uses. This has come about because of its location and in addition because there is no economic benefit from agricultural land. There is, therefore, a need to establish a plan to increase the economic benefit from the agricultural land for its owners, to encourage them to protect it and not to change it to other uses. (Interview/Questionnaire survey 1997-2000)

Another respondent points to a factor which we have already noted, namely that people are leaving the agricultural land because it is financially beneficial to put it on the market. Selling land brings in more money than cultivating it and selling its product, so that whatever the municipality do to protect the agricultural land of the oasis, the land owners will find a way to seek planning permission to convert the land to other uses on the grounds that it is non-productive. This, of course, contributes to the demise of farms.

A further comment that the researcher received highlights the fact that the amenities and infrastructure now provided by the municipality in the Al-Qatif oasis area, such as the corniche recreation area and the new airport, have made it so attractive that many incomers from all over the Kingdom and from the Gulf countries now seek to live there.

Another factor playing a part in the loss of agricultural land is the fact that many people, being members of extended families, have become willing to pay the high prices that are now demanded for land, in order to remain near their relatives. Extended families need more than one house to accommodate themselves, and they would rather let agricultural land die and seek to convert it to residential use, or buy land for building, than split the family by moving away to cities such as Jubail or Dammam.

When residents are interviewed, on the other hand, they often give a different reason for leaving agricultural land and taking up other jobs. Many of them remark that the Ministry of Agriculture and Water (MOAW) do not give loans to the same extent as before to cultivate agricultural land. In particular they cannot borrow enough to buy new machinery to compete with large-scale farming operations. Other reasons for abandoning farming, such as the availability of attractive and lucrative employment in the government and private sectors, are also given by residents of the agricultural areas of the oasis. When asked about the dubious practice of causing the death of trees in order to seek planning permission to convert the land to other use, the response is that it is the responsibility of the municipality and the Department of Agriculture and Water, because these are the bodies which brought this situation about by using imported trees from outside Saudi Arabia and planting them in the oasis (see Figures 8.47 and 8.48). The issue of trees has become problematic because the municipalities and the Department of Agriculture and Water, when developing main city roads in the oasis area, constructed these roads by imported trees while native trees were left to die, unused. While Figures 8.47 and 8.48 show imported trees Figures 8.49 and 8.50 show the state of native trees. Native local trees will do the job that imported trees do, and without the cost. In addition imported trees often bring with them diseases which affect the local Saudi trees, and for this reason the

government has recently established a regulation to stop the importation of some trees.

Figure 8.47. One of the Al-Qatif city commercial roads planted with imported trees.

Figure 8.48. Trees planted at the side of the road while in the same time the agricultural land is destroyed by the construction activities in Al-Qdih village.

Figure 8.49. The state of the palm trees and the agricultural land in Al-Toby village.

Figure 8.50. The state of the agricultural land and the trees in the oasis destroyed by residential and industrial activities.

In addition to that the growth of the oil and gas industries in the Gulf region has resulted in a decline in the agricultural and fishing sectors. Food exports, financed from crude oil export earnings, not only grew rapidly but also underwent structural change so that cereals, especially rice and wheat, have come more into demand than dates for example, which has caused many farm workers to leave for other jobs.

Traditional irrigation practices largely using water spreading techniques are also responsible for a greater loss of valuable water through over-watering from newly drilled artesian wells which, together with very high rates of surface evaporation, had led to the formation of soft crusts in many cultivated areas such as the Al-Qatif oasis (Barrell, 1976).

In this context, National Development Plans have stated, as a major objective, meeting the present and future water needs of the country and conserving water resources, especially non-renewable ground water resources. The aim is to develop these resources to respond to current and future demand. The Fourth, Fifth, and Sixth Development Plans provide for land to be given to agricultural uses in areas with high potential renewable water resources. The Fifth National Plan states:

> Following information gained by means of land classification surveys, cultivation assistance will be given only to these areas with high potential renewable water resources. Areas with substantial ground water depletion rates will be picked out and regulations will be introduced in respect of water utilisation an acreage for specific crops. (MOP, 1990, p. 194)

It is further stated:

> Investment will be encouraged in areas with large quantities of renewable water resources using modern irrigation systems and consuming low quantities of water. (MOP, 1995, pp. 215-216)

A comparison between Figure 5.1 in Chapter Five and Figure 5.5 is instructive. Figure 5.1 indicates the country's water resources according to whether they are renewable or non-renewable, and Figure 5.5 shows the zones for agricultural expansion. It can be seen that most of the agricultural expansion zones are in areas where the water resources are non-renewable. At the same time large scale urban development has taken place in areas which are dominated by non-renewable water resources, such as Al-Qatif oasis (see Chapter Three and Chapter Seven in particular).

We should also consider the amount of oasis land lost in the urbanisation process; it is, again, located largely in the non-renewable water area. The official emphasis was that investment would be in an area with a large quantity of renewable water resources. Al-Qatif oasis, however, is in an area dominated by non-renewable water resources. There is an assessment need in order to protect the agricultural land of the oasis, which is under smallholdings and located in areas which are classified as having non-renewable water resources, and to avoid losing the agricultural land in the near future. Such considerations are still not taken into account, although the MOAW participates in physical development at the local level through the approval or

disapproval for physical development initiatives on agricultural land within the boundaries of the municipalities.

8.3.2 Integration and Co-operation

MOMRA has been introduced in Chapter Six and its responsibilities, national strategy, objectives, and policies are explained in Section 6.2.2 and Section 6.2.3. The role of MOMRA at the national, regional, and local level is explained in Section 6.7.

An examination of the role, objectives, policies, and programmes of MOMRA shows that its responsibilities are vast and they essentially concern developing urban and rural areas. One of the MOMRA's objectives, as stated in the Sixth National Plan, is

> to continue improvements in citizens' living, health and environmental conditions throughout the Kingdom and to contribute to the completion of infrastructure needed by other ministries to perform their development role. (MOP, 1995, p.385)

MOMRA is charged with planning for urban development, whether at national, regional, or local level, in collaboration with other bodies. It mentions in the Sixth National Development Plan 'planning for urban development at both local and regional levels in cooperation with the concerned public and private agencies' (MOP, 1995, p. 386).

MEPA, the main agency charged with the control of pollution and the protection of the environment, is reviewed in Chapter Four (Section 4.3). One of its functions is to establish environmental standards and specifications for pollution control and environmental protection in a definite and stable form for them to be considered by the appropriate authorities when issuing permits for industrial and agricultural projects which may have an environmental impact. The responsibilities of MEPA are great, essentially in the areas of environmental study and protection (see Section 4.3). The national environmental policies documents propose that the policies should harmonise the planning and institutional dimensions by achieving balanced sustainable growth,

while making the best possible use of and extending the life span of natural resources, especially non-renewable resources. A sustainable balance should be maintained between population distribution and the absorptive capacity of the environment, with due consideration given to the consequences of population growth and consumption patterns for the natural resources of the country.

The responsibilities of MOMRA and MEPA outlined above apply at the central level since MOMRA is the responsible body for physical development and one of its duties, as explained in Chapter Six, is to prepare plans, programmes, and policies for any area subjected to specific development. This is done through the municipalities at the regional and local level. It is clear that when the municipality is involved in the process of plan preparation, plan alteration, approval, and implementation, there is a lack of comprehensive co-operation and integration between it and the branches of the ministries involved in physical development and environmental protection. Table 6.3 shows the responsibilities of local branches of the central ministries involved in urban and physical development. It is clear that most of them are involved in the provision of services to the proposed physical development rather than in its evaluation in terms of environmentally sound development.

The existing co-operation lacks the clear and strong application of the MEPA regulations and standards to the approved plans, programmes, and policies of the municipalities.

This has been confirmed by a city planner working at the Department of Urban and Regional Planning in the Dammam municipality. He states: 'There is no overall co-operation between the municipality and MEPA. However, there is a certain amount of co-operation in some specific projects.' (Interview/Questionnaire survey 1997-2000)

Another planner affirms:

> There is no co-operation between the municipality and MEPA in the process of plan making in general. However, there is co-

> operation between them on specific protects such as the coastal project. (Interview/Questionnaire survey 1997-2000).

The common view of the planners questioned is that co-operation does not exist in a general way.

It is clear from the environmental documents and stated policies that MEPA has set up many studies of the environment in Saudi Arabia. However, the findings of these studies are not applied, implemented, or approved at local level. There is no use made of comprehensive data on the state of the environment in Al-Qatif oasis, there is no application or implementation of EIA, and there is no SEA of plans, policies, and programmes at Al-Qatif oasis.

The researcher's field survey shows there exists no requirement for an environmental assessment document to be presented, whether by a private or public owner, with a plan going for approval to the municipality, and there is no requirement for the municipality to receive approval for a plan from MEPA in turn before itself giving approval. The municipality also does not need to carry out an environmental assessment study when considering a development request, which demonstrates the lack of full co-operation.

There seems to be a gap or a lack in communication between MOMRA and MEPA at the local level, which results in the loss of agricultural land as a valuable, non-renewable natural resource in Al-Qatif oasis.

Responses given to the researcher in the course of his fieldwork by Al-Qatif Planning Department staff indicate that there is a lack of co-operation between the municipality as the body responsible for physical development and MEPA as the body responsible for environmental and natural resources.

One planner asserts: 'Co-operation at the local level is very weak and limited, and this has happened as a result of the absence of environmental planning in the municipality.' (Interview/Questionnaire survey 1997-2000)

Another planner stated:

> MEPA provides the required information at the local and national level. However, this is according to the demand for specific projects, whereas it needs to be part of a comprehensive and ongoing set of procedures. (Interview/Questionnaire survey 1997-2000)

These views have been borne out by yet other members of the planning staff, one of whom states: 'According to my knowledge local co-operation is not organised to integrate with the national policies.' (Interview/Questionnaire survey 1997-2000) Another planner affirms: 'I do not know of any existing co-operation from MEPA to provide information to the municipality.' (Interview/Questionnaire survey 1997-2000.)

In addition, the impression is given by officials that there is a lack of co-operation between MOAW, MEPA, and MOMRA at the local level in terms of training and exercise programmes in environmental studies and sustainable development, and how to use sustainable development tools in practice. This plays a very important role in the loss of the natural resources of the oasis.

Another point is that, while environmental assessment is supposed to encompass certain procedures (setting goals and objectives, collecting data, analysing data, establishing standards and criteria, selecting the best alternatives, and implementing the plan) it appears to be following only some of them. The rest of the assessment process is missing. At the same time there seems not to be full involvement of MEPA, one of the responsibilities of which is to establish environmental standards and criteria. This lack of MEPA involvement is one of the factors which have increased the loss of natural resources in the Al-Qatif oasis. This appears at odds with the policies expressed in the Sixth National Development Plan, which speaks of

> taking environmental consideration into account in the various stages of development project (i.e. planning, design, construction, operation) in all sectors, especially the producing sectors of agriculture and industry, whereby all projects shall be subject to environmental impact assessment. (MOP, 1995, p. 410)

Our review has made it clear that there are many agencies participating in physical development and environmental protection (see Chapters Three, Four, and Five). The main agencies to be singled out are MOMRA, MEPA, and MOAW, which are involved at both central and local level. An assessment of the plans, policies, and programmes of these bodies, however, indicates that their practical involvement is largely at the national level. There is a lack of co-ordination and co-operation and of specific input at the local level.

It is not the main concern of this thesis to propose a new structure for these agencies but to highlight the lack of co-operation and co-ordination which might result in a negative environmental impact because of the destruction of natural resources of the Al-Qatif oasis and its settlements. In addition to this lack of co-operation there is a legislative and implementation deadlock between the various agencies involved in development and in the environment in Saudi Arabia. However the research suggests guidelines to fill the gap in respect of these important issues caused by the lack of co-ordination and integration.

The issue is one which causes much heat within the Kingdom. Articles dealing with it have appeared in Saudi newspapers and researchers have indicated the need for a combined Ministry of the Environment, which would bring together all environmental activities, based on the Islamic ethics governing the relationship between man and nature. Others have proposed a Supreme Council for the Environment, and yet others a redistribution of authorities and a restructuring of the main environmental agencies (Al-Simani, 1996; Joma, 1991; Al-Soliman, 1993; Al-Gilani, 1998). All this discussion has focussed attention on the lack of co-operation and integration between the different government agencies.

8.3.3 Education and Participation

The discussion in Chapters Three, Four, Five, and Six makes it clear that the policies for physical development and environmental protection have been produced with little participation by the public in the process of their conception and realisation. Nevertheless, as is indicated in Section 3.5, there does exist at central level the

Council of Ash-Shura, established by Royal Decree No. A/91 in 1992. This association consists of ninety members and functions as a consultative body to the government. It has, however, no legislative authority.

The Council expresses opinions on the state's general policies referred to it by the Prime Minister. The Council may in particular:

1. Discuss the general plan for economic and social development, stating its opinion on it.
2. Study regulations and rules, international treaties, agreements, and privileges, giving its opinion on them.
3. Interpret laws.
4. Discuss annual reports prepared by the ministries and other government departments, giving its opinion on them (Al-Mobarak, 1993).

In addition there is the Provincial Council at regional level. Its members are selected from within the provinces and sometimes ministry representatives. The Council has no power to approve or reject a plan approved by a municipality.

The participation of the public in decisions about development and environmental protection is a major element in reaching sustainable development. We have seen, however, that MOMRA, the body with the greatest degree of responsibility at both central and local level from the preparation stage to the implementation stage of plans, policies, and programmes, makes no allowance for the participation of the public in the process. This has resulted in many complaints from the public (see Chapter Six, Section 6.8.3).

Chapter Four, which deals with environmental policies and documents in Saudi Arabia, points out the concern shown by the government for public awareness and education in the Sixth Development Plan (1995-2000). It states in the Plan programme :

> Information and environmental awareness: This programme aims to provide information and raise citizens' awareness at all levels about the environmental significance and beauty of wildlife and to provide them with opportunities for positive

> responses to the activities of NCWCD through information campaigns, specialized films and scientific symposia. (p. 411)

Some agencies such as NCWCD have managed to produce some effective media programmes and reports to increase awareness and education about the protection of the habitat and wildlife conservation. The *Amanat* and the municipalities have also established some programmes to educate the public about the environment and increase their participation in the protection of it. 'Tree Week', for example, is an active awareness campaign by municipalities throughout the Kingdom aimed at encouraging the planting of trees.

There is a need, however, for further campaigns to educate the public in such matters as the need not to cut trees in the Al-Qatif oasis and its settlements. This is particularly true in the face of the clear indications to the public given by officials working in the municipalities and sub-municipalities that there are many ways in which people can change land from agricultural to residential, industrial, or commercial use. One official from MOAW states:

> The behaviour of the Al-Qatif oasis in particular and the public in general has increased the loss of the natural resources in the oasis in particular and in the Kingdom in general. Therefore they need to be educated and aware of the ways of cultivating their land, the importance of natural resources such as the water and agricultural land, and the coast. (Interview/Questionnaire surevy1997-2000)

Another official adds: 'There must be encouragement from the public and private sectors to the farmers to keep their agriculture land.' (Interview/questionnaire survey 1997-2000)

Another official in the Dammam municipality states: 'Agriculture tools and equipment should be provided to the farmers at reduced prices and in addition they should be educated how to use them through the media.' (Interview/Questionnaire survey 1997-2000)

It is clear that there is a lack of education, participation, and co-operation of the public in Al-Qatif oasis, which has resulted in the loss of the natural resources of the oasis and a negative environmental impact in Al-Qatif oasis.

This has been confirmed by the city planners in the municipality. One planning official states:

> When the Al-Qatif oasis residents realised that the gain (money) from residential projects in the oasis is more than the benefit of agriculture projects, this resulted in them losing interest in agriculture and production and the protection of the oasis environment. (Interview/Questionnaire survey 1997-2000)

Another planner claims:

> Al-Qatif oasis residents used to care about and protect agricultural land and the natural resources in the oasis. However, when it became unattractive economically they started to pressurise the municipality to change the use to residential purposes. (Interview/Questionnaire survey 1997-2000)

One official comments thus on the situation regarding the co-operation of the residents in the oasis:

> The co-operation of the Al-Qatif oasis residents in the development of the oasis and the protection of its environment is limited. This results from the lack of a management plan for the oasis which would provide for the participation and co-operation of the residents in the development and protection of its environment. There does exist co-operation in the following areas: protecting the water channels and cleaning dirt and garbage from them, collecting the garbage and sending it to its collection points, and the cleaning of farms, specially their entrances and the roads leading to them. (Interview/Questionnaire survey 1997-2000)

The responses to the survey made by residents and property owners in Al-Qatif oasis indicate that the lack of awareness and education about environmental matters and the loss of agricultural land has been a real obstacle to sustainable development in the area. The people are simply not aware of government policies related to development

and environmental protection. These issues have been aired in the local newspaper, as the following cartoons show.

Figure 8.51. A man and his daughter are watching a programme about man's search for somewhere to live on another planet. Man: Why are human beings looking for another planet? Daughter: Because human beings have already destroyed life on earth.
Source: Al-Jazirah newspaper, 27 March 1999.

Figure 8.52. Two men are discussing trees. One points out the importance of trees and vegetation, and claims that we should protect the tree and regard it as a source of leaves, shade, medicine, and food. The other man's response is, 'How about the wood?' This indicates the lack of awareness in the public about natural resources.
Source: Al-Jazirah newspaper, 26 November 1998.

On the subject of the lack of co-operation on environmental issues from the Al-Qatif public, one planner stated:

> There is no co-operation from the residents of Al-Qatif oasis and their role is negative. In addition, they have so many opportunities and ideas to respond in a negative way to the legislation of the municipality permitting a change in the uses of agricultural land and its development for residential or commercial purposes. One way they use, for example, is to leave the agricultural land without water or care for an extended period, so that it will die. (Interview/Questionnaire survey 1997-2000)

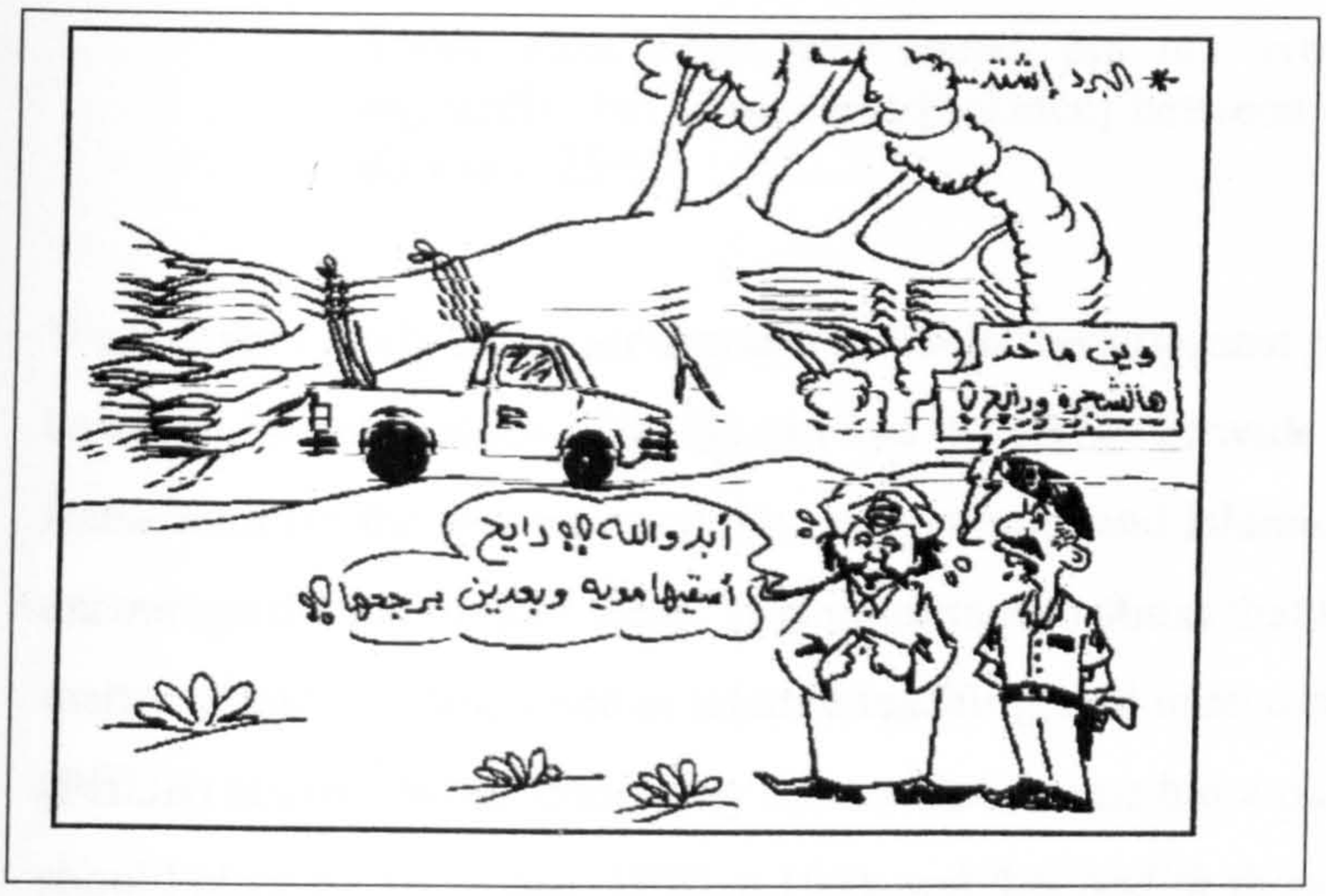


Figure 8.53. It is winter, and the policeman asks the other man, 'Where are you going with this tree?' The other man's response is, 'I am going to give it some water and then I will bring it back.' This indicates the demand on wood in the cold weather from the public without consideration to the importance of national natural resources.
Source: Al-Jazirah newspaper, 22 November 1998.

It is of crucial importance for Al-Qatif oasis that the policies articulated at national level should be applied at local level, where the residents lack a comprehensive understanding of sustainable development and of the impact of their actions on the protection of the agricultural land and the available natural resources.

Saudi Arabia is an Islamic country and the attitudes of the people have been affected by Islamic teaching. Islamic law covers many aspects of life and teaches a balanced viewpoint towards the protection of the environment, asserting that all creatures, including man, are created by one merciful God, the sustainer and ruler of all that exists. Islamic teaching supports the prohibition of wasteful extravagance of natural resources, the preservation of the ecosystem of the planet, the protection of animal

rights, the efficient use of water and land for agricultural development, and the development of dead land. The Kingdom of Saudi Arabia applies Islamic values in its policies aiming to develop and protect the environment. It states in the Qur-an:

> And the earth we have spread out, like a carpet; set thereon mountains firm and immovable, and produced there all kinds of things in due balance. (Qu-ran, 15:19)

And it goes on:

> Those who, when they spend, are not extravagant and not niggardly, but hold a just [balance] between those [extremes]. (Qu-ran, 25:67)

We can see clearly from our account of Saudi development policies that they are based on Islamic values. The Qu-ran and the *hadith* provide a comprehensive framework for the protection of the environment, and Islamic law and teaching encourage the planting of trees. It is important to stress that the planting of trees is a matter of some significance in Islamic teaching, and indeed the prophet Mohammed (PHUB) stated: 'When doomsday comes if someone has a palm shoot in his hand he should plant it' (Izzideen, 1990, p.194), and this *hadith* shows that the principles of sustainable development have a sound Islamic foundation. In addition to producing food, in a hot country such as Saudi Arabia trees function as a barrier against dusty winds and reduce waves of hot air. They aid fertilisation and help reduce the effect of carbon dioxide, acting to counter industrial and traffic pollution of the atmosphere, to lessen unpleasant smells, and to diminish noise pollution. The planting of palm shoots continues the process of development and will sustain life.

A traditional Chinese proverb sums up well the importance of trees in the ecological balance of a region:

> If you are thinking one year ahead plant rice. If you are thinking ten years ahead plant trees. If you are thinking a hundred years ahead educate the people. (Ady and Waller, 1989, p.104)

The tree situation, and indeed the environmental education situation, in Al-Qatif oasis, however, clearly fall short of this ideal. An official in the planning department at Dammam Municipality explains: 'There is a need to establish a plan or programmes

to educate the residents of the oasis about the natural resources in the oasis and sustainable development.' (Interview/Questionnaire survey 1997-2000)

Another official in Al-Qatif municipality stated:

> To reach sustainable development and preserve the natural resources of the Al-Qatif oasis, the education sector should be involved very seriously in educating the public, especially in the early stage of their schooling. (Interview/Questionnaire survey 1997-2000)

The practice of sustainable development and environmental protection, then, go back to the time of the prophet Mohammed (PBUH). Islamic teaching and law reject the unnecessary and uncontrollable squandering of natural resources.

In Chapter Three mention was made of Al-Amro Bil Maroof Wal Nahi Anil Moniker (OOABNM). This outfit is involved in physical planning development at both central and local level in that it issues regulations to be enforced by local authorities in relation to building and site use. The name of the organisation means in English 'organisation for commanding good and forbidding wrong'. In reality, however, its contribution to physical development planning and environmental protection is non-existent. In practice its duties are confined to matters related to social conduct and religious practices in particular in market places, such as ensuring that all merchants in the market close their shops during prayer times.

Since the ultimate goal of any Islamic country is to implement what commands good and what forbids wrong, Muslims should realise in conducting their private and public lives the importance of what God has given on the earth and should take care not to destroy it (see Chapter Two). The Qur-an describes Muslims thus:

> And the believers, men and women, and protecting friends of one another, they enjoin the right and fear the wrong. (Qur-an, 9:71)

These passages emphasise the Qur-anic derivation of the Islamic principles in relation to developing the earth without damaging it by destroying agricultural land and

natural resources, including the agricultural land and resources of the oases. To achieve this, sustainable development seems to be the best direction to take.

In relation to this Izzideen (1990) states:

> It is not only necessary to involve the public in conservation policy but also to improve its morals and alter its attitudes. In Muslim countries such changes should be brought about by identifying environmental policies with Islamic teachings. (p.197)

It is clear that the problem of the loss of agricultural land as a natural resource is related to the attitude of the residents towards the protection of the oasis and to the attitude of the officials towards applying planning standards. The lack of spiritual purity, the unlimited desire for expansion and for power, the lack of respect for God's creation, and the failure to realise the benefits of implementing good practices and forbidding bad practices have all played their part in the matter. Human beings should not only enjoy and use their surroundings; they are also required to preserve, protect, and promote the wellbeing of their fellow creatures.

Muslims should try to the best of their ability to do what is good and right in accordance with their understanding of the Qur-an and *Sunnah.* As Umar bin Abdul-Aziz, one of the prophet's (PBUH) followers and the fifth *Khalifa* (Caliph) in Islamic history, once said: 'He who serves God without knowledge does more harm than good.' (Joma, 1991, p.427)

Al-Gilani (1998) states:

> To guarantee the survival of future generations two main obstacles must be overcome: the irresponsible greed of the rich and the lack of respect for God's creation, which is common for most human beings. The concept of man as a steward and viceregent must be propagated and incorporated in any policy or legislation acts with regard to environmental issues. (p. 42)

8.4 Summary

This chapter consists of two parts. The first has shown the impact of urban development on the natural resources of the oasis. It is clear that through the past three decades its impact on the natural resources of Al-Qatif oasis has been very great with the agricultural land and the natural and physical environment being particularly affected by this development. This part of the chapter in addition shows the extent of the negative impact of the development on the air, sea, and land. Figures (including photographs) and tables aid in illustrating the decrease of the natural resources and condition of Al-Qatif oasis.

The second part, through its analysis Chapters of Two, Three, Four, Five, and Six and the field survey data collected, has highlighted the main points which have played a very important role in the unsustainable development in Al-Qatif oasis. Attention is drawn to the lack of comprehensive development policies taking into consideration environmental protection, the lack of sustainable development tools, the lack of co-ordination between the government sectors involved in physical development and environmental protection in Al-Qatif oasis, the failure to implement existing policies taking consideration of sustainable development, and the lack of participation and education of the Al-Qatif oasis residents.

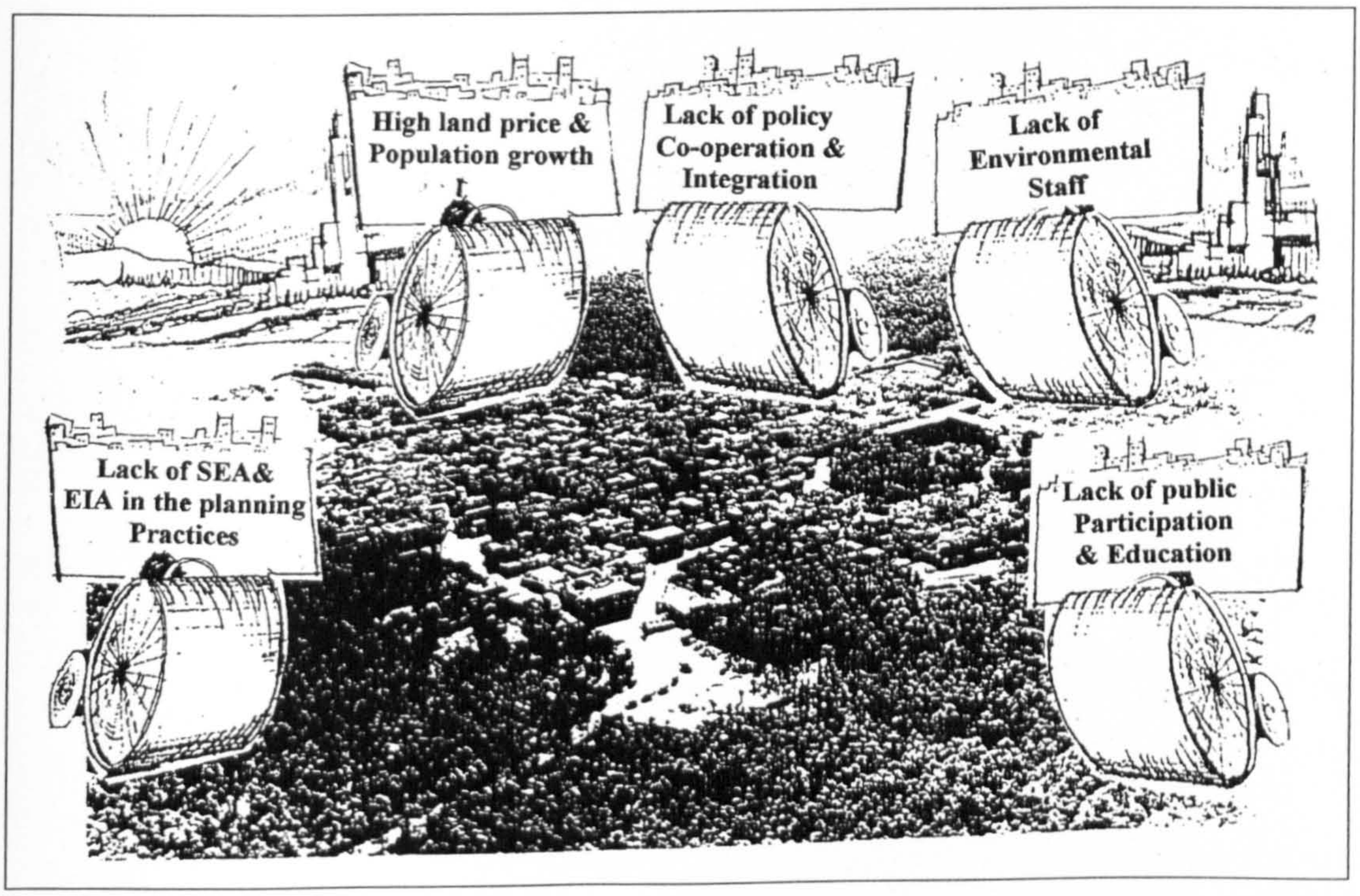


Figure 8.54. Factors affecting sustainable development in Al-Qatif oasis.
Source: Developed by the researcher , from Marshall, (1983).

The next chapter will introduce a guideline to try to fill these gaps, which is based on the literature review of the practice of other countries, and which would be workable in the framework of Saudi Arabia. It will aim to bring about at local level the implementation of the existing sustainable development policies at the national level, and to have them implemented in an effective way, in order to fill the gaps that inhibit sustainable development in Al-Qatif oasis.

Chapter 9

Towards Sustainable Development - General Discussion, Conclusion and Recommendations

9.1 Introduction

The research, through a study of the literature and through the investigations carried out by the researcher during his survey and search, has been able to permit certain conclusions about the factors that cause and contribute to the existing situation of unsustainable development in the Al-Qatif oasis.

The factors that cause and contribute to this problem may be found within:

- Urban, environmental, agricultural and water policies
- Integration and co-operation in relation to policies
- Education and participation.

These factors have been identified following the examination and assessment of the data collected in relation to the research in hand. Each factor will be introduced and discussed in detail below, followed by proposed guidelines and general discussion for more sustainable development and recommendation.

9.2 Urban, Environmental, Agricultural and Water Policies.

Within this area the following can be identified as sub-factors:

A. Factors related to urban and physical planning development policies
B. Factors related to environmental policies.
C. Factors related to agricultural and water policies.

A. Factors related to urban and physical planning development policies. The literature review carried out in Chapter Two highlighted some tools, instruments, and principles which can be used to achieve sustainable development. Examples of these include environmental impact assessment (EIA), strategic environment assessment (SEA), and land use planning.

Achieving sustainable development in Saudi Arabia requires exploring how other countries prepare and implement sustainable development strategies. Chapter Two, therefore, briefly introduced some of the tools, instruments, and approaches of other countries to illustrate how sustainable development has been dealt with there. Through an investigation of the experience of other countries it has been possible to build up research information and from this to assess the factors that act as obstacles to sustainable development at a central level, which means an effect on the oases at the local level. Guidelines can thus be formulated to show the way to sustainable development in Al-Qatif oasis and its settlements for the present generation and the next one.

What is clear is that the main issue is not whether the countries of the world should pursue economic development, but how this development should take place. The importance of environmentally sustainable development and the relationship between economic, social, and environmental issues were well recognised by the UN General Assembly in 1983 with the establishment of the World Commission of Environmental Development. The Brundtland Report 'Our Common Future' introduced the concept of sustainable development and defined it as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (p.8).

In Saudi Arabia it has been shown from the literature review carried out in Chapters Three and Six and the analysis of the case study area in Chapters Seven and Eight that there is a lack of comprehensive sustainable development policies and tools both at a national and a local level. Further, though national policies have introduced some tools such as SEA these are still not fully implemented at local levels such as exemplified by Al-Qatif oasis and its settlements.

The lack of specific standards and comprehensive policies and guidelines for EIA and SEA specifically for the oases of the Kingdom in general and Al-Qatif oasis and its settlements in particular has become clear.

As the main government body concerned with physical development in the Kingdom of Saudi Arabia it is the responsibility of the Ministry of Municipal and Rural Affairs (MOMRA) at the national level to produce new sustainable development policies and tools, such as EIA and SEA, and planning tools such as zoning land use, and to implement them at the lower level in cities and settlements such as Al-Qatif.

It should also be noted that SEA and EIA need to be adopted and implemented in the planning process at all levels – municipal as well as national and regional - not just at higher levels, since it is the municipalities who are responsible for the existing process of development at local levels (such as the level of Al-Qatif oasis). This has been stressed in Chapters Six and Eight, where it has been pointed out that there was no requirement to present any environmental impact statement or documents to the municipality when development took place in Al-Qatif oasis and its settlements. SEA and EIA are important tools in achieving sustainable development through the assessment of the impact of plans, policies, and programmes such as land use policies, the Al-Qatif master plan, and other planning moves. Through SEA and EIA these initiatives can be assessed from the point of view of their potential impact in the environment.

In addition land use planning is a further enterprise that can play an important role in achieving sustainable development in Saudi Arabia in general and in Al-Qatif in particular, as discussed in Chapter Three. Detrimental environmental, social, and economical consequences have often followed in the past because of inadequate land use planning policies. Failure to integrate tools such as EIA and SEA into the planning process has been one cause of the loss of natural resources in the oasis. Policies introduced by MOMRA at the national level can be used at the municipality level to integrate these tools into the planning process.

Other tools, as noted and discussed in Chapter Two, include the use of sustainable development indicators, which can be used to explore priority action areas and can also be used in measuring progress during and after the implementation of plans. Indicators are tools used to measure progress in attaining sustainable development, such as improvements to social, environmental, and economic conditions. This can be

translated from the national level in Saudi Arabia to the level of Al-Qatif and its settlements.

The lack of comprehensive guidelines and requirements in MOMRA at the national level relating to the environmental appraisal of development plans at regional and municipality level has been noted through the review of Chapters Three, Six, and Eight.

In the UK an admirable initiative has been taken by the government to encourage local authorities to integrate environmental consideration properly into development plan preparation. Local authorities have been provided with the required guidelines, such as 'Environmental Appraisal Development Plans – Good Practice Guide' (DOE, 1993) which

1. characterises the environment by identifying components of 'environmental stock' that might be affected by development plans;
2. emphasises scoping, whereby it is ensured that the scope of a plan covers an appropriate range of environmental concerns;
3. appraises policies and proposals to establish their environmental impacts; and
4. presents the appraisal.

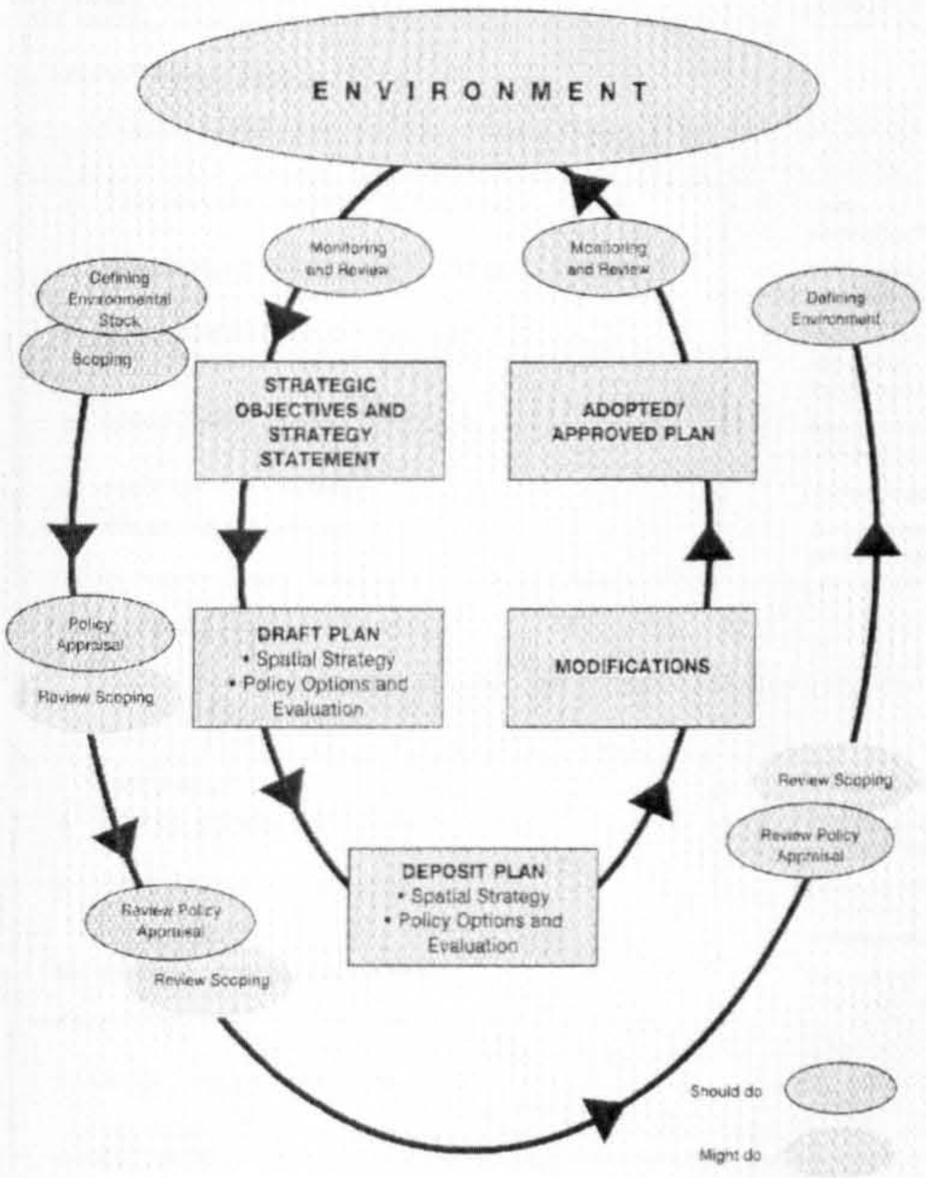


Figure 9.1

STAGE OF PLAN MAKING	ENVIRONMENTAL APPRAISAL		
	defining environmental stock	scoping	policy appraisal
strategic objectives and strategy statement	●	●	
pre-consultation/draft plan - spatial strategy - policy options & evaluation		○	●
pre-deposit plan - spatial strategy - policy options & evaluation		○	● Review
modifications post EIP/PL1		○	● Review
monitoring and review post adoption/approval	● Review and monitor		

● essential appraisal

○ supplementary appraisal as appropriate

Figure 9.2

Figure 9.1. The plan-making process and environmental appraisal.
Figure 9.2. The timing of appraisal in plan-making.
Sources: DoE (1993).

1. Characterising the Environment.

This process identifies environmental criteria, allowing environmental factors to be considered throughout the plan and encouraging consistency across planning areas and integration with other environmental information sources. This makes it easier to monitor the effectiveness of the plan. It divides 'environmental stock criteria' into those related to global sustainability, natural resources, and local environmental quality. A suggested list of stock elements is set out in Figure 9.3. Such a list can never be definitive as individual authorities may need to adapt its content and descriptions to their own circumstances and priorities.

GENERAL CRITERIA	INDICATORS OF POSITIVE IMPACT
Global Sustainability *- primarily concerned with atmospheric and climatic stability and with the conservation of biodiversity*	
1 TRANSPORT ENERGY: EFFICIENCY - TRIPS:	* reducing trip length * reducing the number of motorised trips
2 TRANSPORT ENERGY: EFFICIENCY - MODES:	* increasing public transport share * increasing attraction of walking and cycling
3 BUILT ENVIRONMENT ENERGY - EFFICIENCY:	* reducing heat loss from buildings * reducing capital energy requirements * increasing CHP potential
4 RENEWABLE ENERGY POTENTIAL:	* safeguarding wind, water, wave and biomass potential * increasing direct solar gain
5 RATE OF CO_2 "FIXING":	* increasing tree cover especially broad-leaved woodland
6 WILDLIFE HABITATS:	* safeguarding designated sites (e.g. SSSI's) * increasing general wildlife potential (e.g. corridors)
Natural Resources *- husbanding of natural resources concerned with appropriate use and, where necessary, appropriate protection of our resources of air, water, the land and its minerals*	
7 AIR QUALITY:	* reducing levels of pollutants (CO_2, SO_2, NO_x, O_3, Pb, NH_4, etc.)
8 WATER CONSERVATION AND QUALITY:	* maintaining ground water and river levels * safeguarding water supply purity
9 LAND AND SOIL QUALITY:	* safeguarding soil quality and soil retention * reducing contamination/dereliction * safeguarding good quality agricultural land
10 MINERALS CONSERVATION:	* reduce consumption of fossil fuels and minerals * increase reuse/recycling of materials
Local Environmental Quality *- conservation of local environmental quality concerned with the protection and enhancement (and sometimes retrieval) of local environmental features and systems ranging from landscape and open land to cultural heritage*	
11 LANDSCAPE AND OPEN LAND:	* enhancing designated areas (NPs, AONBs etc.) * enhancing general landscape quality * retaining countryside/open land
12 URBAN ENVIRONMENT "LIVEABILITY":	* enhancing townscape quality * increasing safety and sense of security * improving aural and olfactory environment
13 CULTURAL HERITAGE:	* safeguarding listed buildings and CAs * safeguarding archaeological/geological value
14 PUBLIC ACCESS OPEN SPACE:	* increasing/maintaining quality and availability in urban and rural areas
15 BUILDING QUALITY:	* maintaining/improving the maintenance and continuous renewal of buildings

Figure 9.3. Environmental stock criteria
Source: DoE (1993).

2. Scoping the Plan.

Scoping the plan can identify environmental issues which require special attention. In scoping the first step is to identify the appropriate scope of the plan the second is to check the actual scope against the appropriate scope. The main source for this is to be found in the Planning Policy Guidance documents (PPGs), and other sources are from the relevant environmental agencies. Figure 9.4 shows how a PPG can be examined to bring out issues of relevance to the environment, against which the scope of the plan can then be checked in practice.

The example used was PPG4: Industrial and commercial development, and the context is a rural area adjacent to free - standing small city

Source of Guidance	Summary of Guidance	Scope of Plan Okay?	Comments	Actions Needed
PPG4 Para. 6	"Ensure there is sufficient land available readily capable of development and well served by infrastructure"	Yes		None
Para. 8	"Provide specifically for types of industry which may be detrimental to amenity or a potential source of pollution"	Yes	Area to be designated already identified. Do special environmental conditions to be applied on site need to be specified in plan?	Check with: 1. NRA re their letter of x.y.z. Site location agreed, but do they have special requirements, i.e. controls over development? 2. Environmental Health, i.e. scope of conditions - in plan or at applications stage. 3. HMIP.
Para. 10	"Encourage new development in locations which minimise the length and number of trips, especially by motor vehicles"	Yes - except free-standing Science Park proposal		Conflict between Science Park proposal environmental issues needs to be examined in detail.
Para. 10.2	"Encourage new development in locations that can be served by energy - efficient modes of transport"	No - not given any thought yet	Is it realistic to consider PT green levels of service and unsuitability of area for fixed track systems?	1. Think 2. Talk to Highway Authority 3. Talk to PT operators.
Para. 10.3	"Discourage development where it would add unacceptably to congestion"	No	Conflict between intensification of existing centres and congestion.	General policy to be formulated to provide for DC decisions. Aim to attach criteria to areas identified for development.
Para. 10.4	"Transport proposals linked to the development opportunities they create"	Partial	Warehousing proposals linked to motorway intersection; otherwise restrictions on expansion at motorway in order to protect urban area.	None.
Para. 15	"Policies should not seek unreasonably to restrict commercial/industrial activities in residential areas"	No	Previous plan excluded residential areas from potential workshop locations.	Reappraise.
Para. 16	"In rural areas... development necessary to sustain the rural economy should be weighed with the need to protect the countryside"	Yes		None.
Para. 21	"Optimum use should be made of sites and premises in urban areas, taking into account accessibility by public transport"	No		See back to para. 10.2

Figure 9.4. Example of scoping exercise.
Source: DoE (1993).

The scoping exercise can:

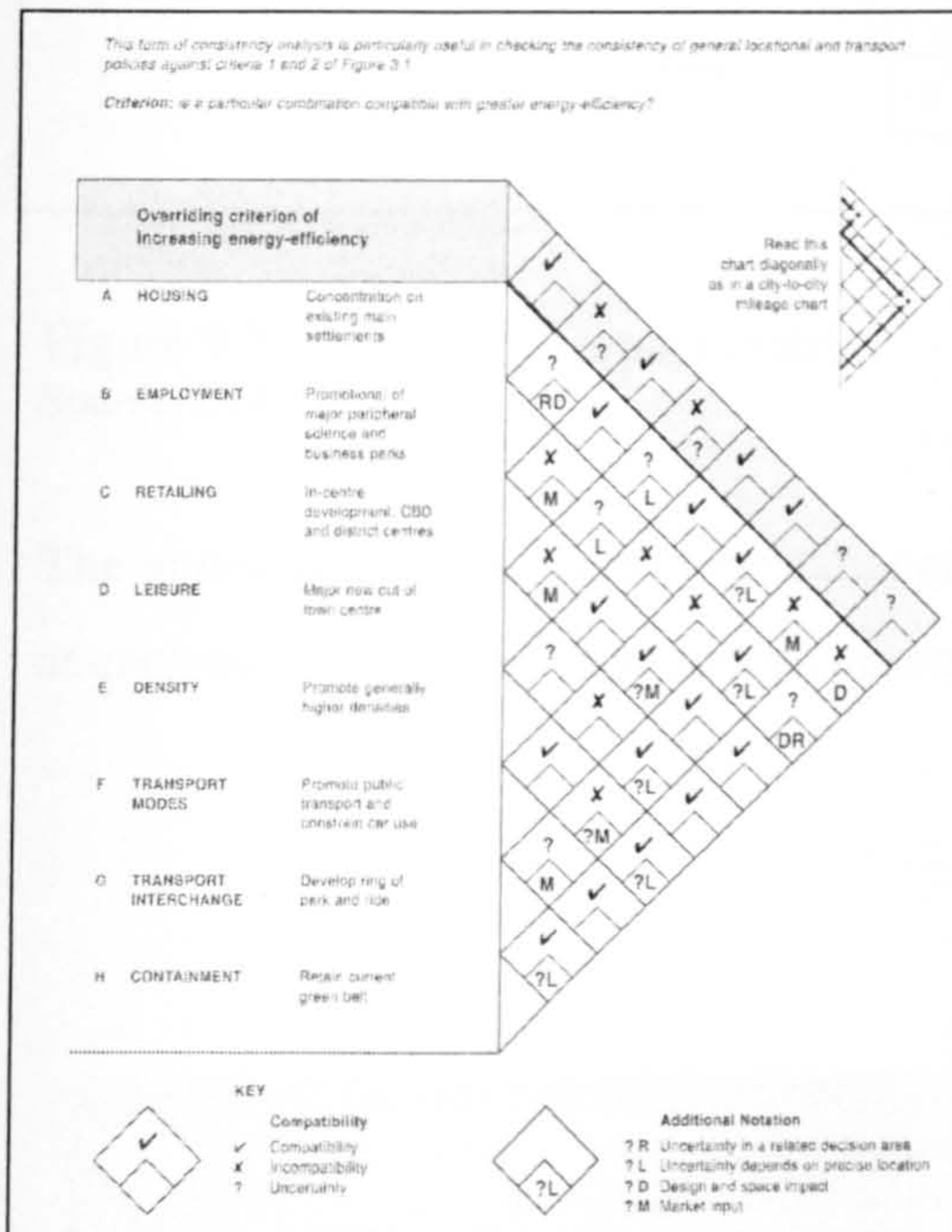
- provide early signs of the environmental issues which will need attention in the plan-making process;
- establish environmental issues at the core of the plan-making process;
- introduce consistency with central government policy and other relevant guidance; and

- reduce any challenges to the plan on the grounds of inadequacy of environmental content.

3. Appraising the Plan Content

'Environmental Appraisal of Development Plans' (DoE, 1993) proposes that the impacts of policies should be evaluated in a matrix, with the environmental criteria listed on one axis, the policies on the other axis, and the impacts of each policy on each environmental criterion described in the relevant matrix cell. In addition the document suggest a 'compatibility matrix' designed to ensure that individual policies or clusters of policies are in line with the plan's overall objectives.

The policy impact matrix as illustrated in Figure 9.7 shows the policies on one axis and environmental criteria on the other, where each cell in the matrix confronts one policy with one aspect of the stock. This matrix is used to illustrate whether there is a positive or negative or neutral impact.



	Comments	Action
STAGE 1. Identify the core of consistent policies		
A HOUSING CONCENTRATION	Consistent	Incorporate in plan
C RETAILING IN-CENTRE	Consistent	Incorporate in plan
E DENSITIES HIGHER	Consistent	Incorporate in plan
F PROMOTE PUBLIC TRANSPORT	Generally consistent, but awkward in relation to retailing, because while the city centre is well served by public transport the district centres are not	Consider focusing any new retail development only on centres having public transport centrality
STAGE 2. Explore Uncertainties and modifications of policies that are not consistent		
B EMPLOYMENT (science and business parks)	Low density development in car dependant location is inconsistent with a higher density public transport based strategy and misses opportunities for mixed use, integrated development	Consider a compact "science city" instead, combined with retail and leisure use, based on a public transport node or focus back on city centre
D LEISURE (new out of town centre)	Exurban single-use centre will have poor public transport accessibility	Link leisure centre to the "science city" idea
G TRANSPORT INTERCHANGE (Park and Ride)	Park and Ride facilitates dispersal of population and low densities in the outer areas, undermining the viability of public transport in those areas	What realistic options are there? Consider Park and Ride as an interim policy. Aim for direct access to public transport services
H CONTAINMENT (green belt)	Green Belt constrains land available on the urban fringe and forces overspill to commuter settlements	Consider release of a sector of the green belt, related to growth around the science city or extend green belt to force concentration

Figure 9.5.and Figure 9.6. Compatibility matrices.
Source: DoE (1993).

Figures 9.5 and 9.6 show the compatibility matrix, where it arranges special strategy objectives and creates cells in which it can be recorded whether the consequences of each pair of objectives are broadly consistent or inconsistent (as shown in Figure 9.5). The matrix is then used to identify potentially incompatible combinations and to trigger subsequent exploration of alternatives as in the commentary in Figure 9.6.

	Global Sustainability						Natural Resources				Local Environmental Quality				
Criteria / Policies	1 Transport energy: Efficiency: trips	2 Transport energy: Efficiency: models	3 Built environment Energy: efficiency	4 Renewable energy potential	5 Rate of CO_2 'fixing'	6 Wildlife habitats	7 Air quality	8 Water conservation and quality	9 Land and soil quality	10 Minerals conservation	11 Landscape and open land	12 Urban environmental "liveability"	13 Cultural heritage	14 Public access open space	15 Building quality

Suggested Impact Symbols

•	No relationship or insignificant impact	✓?	Likely, but unpredictable impact	✓	Significant beneficial impact
x	Significant adverse impact	?	Uncertainty of prediction or knowledge		

Figure 9.7. The policy impact matrix.
Source: DoE (1993).

The appraisal of policies may be enhanced if a clear record is kept of the assessment at each stage. Figure 9.8 shows an appropriate policy record sheet.

Policy No	Original Policy Statement 1					
	Policy Revision 2					
	Policy Revision 3					
	1		2		3	
Criteria of Environmental Stock	Original Policy Impact	Commentary/Action required, where impact is significant	Revised Policy Impact	Commentary/Action	Further Revised Policy Impact	Commentary/Action
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15						

Figure 9.8. Policy record sheet.
Source: DoE (1993).

The appraisal is likely to provide links between policies and specific land use proposals, and both are subjected to an analysis of their impact on common environmental stock. Policies selected following an impact appraisal should set a context for the selection of the development sites, where a more detailed consideration of smaller numbers of aspects of stock is necessary.

4. Presenting the Appraisal

The appraisal process must be clear to those not involved in it, showing how the environment has been taken into account in the formulation of the plan and what the impact of the implementation of the plan might be.

It must not be forgotten, however, that environmental appraisal of development plans in UK is a recent phenomenon. While the UK government has given guidelines for local authorities to help them take environmental factors into consideration in the planning process, not all of them have done so (Therivel et al., 1998: Wood and Djeddour, 1991). Those which have used or adapted some form of appraisal, based on government guidelines, in their development plans have found that it has helped

them to highlight the major environmental impacts of the plans and to identify alternatives which are more environmentally sound. This success has encouraged them to improve planning practices, which may help to bring about sustainable development.(DOE, 1992; DOE, 1993), (Therivel, 1994).

The example of the UK initiative demonstrates that appraisal enables every plan-making authority to undertake environmental appraisal, and to do so in a way which enhances the preparation of good development plans. Appraisal is an integral part of the plan-making process, not a separate exercise to be carried out only once at a certain stage in the process, and it is something that requires the co-operation of other authorities and agencies.

In Saudi Arabia the fact that MOMRA has not provided at central level such guidelines for carrying out environmental appraisal in their Amanat and the municipalities of the Kingdom has resulted in the destruction of the environment in general and the loss of natural resources at the oasis level. The problem, then, needs to be addressed at central level by the introduction of guidelines by MOMRA, and these can then be applied at regional and local level to carry out assessment.

As we have seen in Chapter Seven and Chapter Eight the development that has taken place in Al-Qatif oasis and its settlements in the last three decades has been a result of the five-year National Development Plans, the aim of which has been to develop Saudi Arabia in general and also local areas such Al-Qatif oasis and its settlements. The development in Al-Qatif is under the control and management of *Amanah* the main office, where the case study associated with this research took place. It is up to the municipalities to implement plans, policies, and programmes at a local level under the direction of *Amanah*.

The planning standards overseen by the *Amanah* and implemented by the municipalities in Al-Qatif and its settlements deal with such matters as building densities, streets, land use policies, building height, and zoning in general. It is developments in relation to these factors that have led to the loss of the agricultural land in the oasis. The standards applied have not been very different from those

applied in the large cities of the Eastern Province, and the differences between them and Al-Qatif in terms of topography, climate, and in social and ecological respects have not been taken into account.

The huge physical urban development that has taken place in Al-Qatif and its settlements, involving housing, recreation, and commercial development such as the transportation system and the Al-Cornish project, has been set out in Chapter Seven and Eight. The development has been very important in the province as a whole. However, as we have indicated, it has had a very clear environmental impact whether it is located on land reclaimed from the sea or within the oasis area itself. All of the development was based on existing planning studies of the Al-Qatif oasis, yet it has had an undesirable effect on the environment. This shows the need for environment assessment of policies and programmes.

The negative environmental impact of the urban and physical development in Saudi Arabia in general is set out in Chapter Three, while that on Al-Qatif in particular is set out in Chapter Seven and Eight. The discussion there shows the huge amount in terms of natural resources (renewable and non-renewable) that has been destroyed, and illustrates the lack of suitable sustainable development tools to be utilised.

It has been noted by Yeh and Li (1998) that in China the rapid land use change that has been witnessed since economic reform has meant that there have been problems in the substantial loss of fertile agricultural land in many coastal cities because of short term economic considerations. Such land loss will have negative implications for further economic development and for social stability. Only if urban expansion in China is guided by the concept of sustainable development will rational use of land resources be attained.

We have noted that different components play a part in sustainable development: the supply and quality of major consumables and of inputs to daily life such as air, water, energy, food, raw materials, land, and the natural environment all need to be taken care of. Land is important because it is the source of energy, food, and raw materials, as well as the habitat of wildlife and flora. Land should be seen as, like some other

resources, a scarce commodity, and some of the destruction of its natural resources is irreversible. The conversion of agricultural land into urban land will remove its food production capacity forever. The use of land which is unsuitable for development may damage both the natural environment and human life. For example, housing development through land reclamation may destroy wetland which is valuable natural habitat for wildlife, and may lead to its extinction. It could also lead to the loss of property and human life in the case of flooding. The proper use of land is therefore of the highest importance.

In this context it should be stressed that this study has highlighted the fact that Al-Qatif oasis and its settlements are developed on agricultural land and land reclaimed from the sea, and this has had a negative impact on the oasis and its settlements.

One of the most important contributory factors to this situation is the shortage of environmental staff who have experience in this field in the *Amanah* and the municipalities. This may be contrasted with the large number of architects and planners working in the municipalities where the plans and programmes for the development of the oasis are produced. This lack of staff with training and expertise in environmental matters and the related lack of studies on the natural and physical environment have meant inadequate controls aimed at protecting natural resources or regulating their use.

Related to the shortage of trained and experienced staff is the lack of information and data provision about the environment in the municipalities and in their planning departments, something which emerged plainly from the responses to the researcher by officials in local government employment.

Responses from officials given in Chapter Eight and the assessment and review in Chapters Four and Six make it clear that MOMRA is responsible for all municipal activities in the Kingdom of Saudi Arabia, encompassing those in all urban and rural communities. At the regional and local level mayors manage and co-ordinate all activities including the collection of waste, public services, and environmental health (see in particular Chapter Six). This last mainly covers matters such as licensing, and

the health control of food markets, restaurants, and slaughterhouses. At the same time MOMRA, as we have commented, have no clear strategy in relation to the protection of natural resources. The Ministry plans show no evidence of the adoption of environmental and natural resource principles, which in turn might be translated into applicable programmes.

It has been shown in Chapter Two how important it is to provide an environmental impact statement to check and, if necessary, amend the anticipated environmental impact of any project before it takes place. Despite this, it is clear from the analysis in Chapter Eight that the municipality of Dammam, in the form of its Department of Physical Planning, and the Municipalities and sub-municipalities in Al-Qatif oasis and its settlements gave permission for the development of projects without requesting any prior environmental assessment studies. When this is set alongside the fact that there is no environmental department in the *Amanah* it is clear that the main consideration has been more to economic development than environmental concerns.

When we consider the duty of MOMRA as the main authority involved in regional planning and city management (see Chapter Six), it is disappointing to note its lack of awareness towards the natural resources of the oasis, particularly since an authority with such wide-ranging powers as MOMRA has great potential to contribute to an improvement in environmental qualities and standards at regional and local level. As we established in Chapter Seven and Chapter Eight local municipalities pay no attention to the environmental problems of the oasis, and no policies, plans, or regulations exist to monitor and control environmental qualities in Al-Qatif oasis and its settlements.

In contrast to this lack of awareness in some quarters there has been the State of the Environment (SOE) Report reviewed in Chapter Two and Chapter Five. This report is a very important source of information for help in the decision-making process and planning for sustainable development. However, the SOE Report has limited application as it is a general overview of the Kingdom of Saudi Arabia as a whole; there is no specific report for areas such as Al-Qatif oasis and its settlements which

might be used when planning and developing the oasis. This has been stressed by Jacobs (1993):

> An essential basis of any attempt to plan for sustainable development is to understand the state of the local environment. The plan for sustainable development must rest on at least basic information about local quality and conditions. (p. 30)

Jacobs outlines and emphasises the major assets and services in the local environment on which information may be required, including the following:

Renewable resources:	Soils
	Trees and woodland
	Fish and marine life stock
	Water (surface and ground)
	Renewable energy sources (wind, waves, sun, biomass, etc.): production and consumption.
Non-renewable resources:	Fossil fuels: protection and consumption
	Energy efficiency
	Aggregates and other minerals
	Land.
Natural and semi-natural:	Landscapes (landscape character, landscape features)
	Natural habitats and species
	Diversity
	Open space (farmland, recreational land)
	'Rurality', the character of the countryside
	Coastline and beaches.
Wastes and pollution:	Land (dereliction, contamination, landfill sites, pollution, total waste collected, recycling rate)
	Air (local air quality), atmosphere (greenhouse gases, global pollutants and ozone depleting gases)
	Water (water quality, surface, underground, and ocean).

Man-made assets:	Building and other structures
	Sites of archaeological or historic interest
	Townscapes
	Transport routes, including local roads, rights of way,
	Cycle paths, and railways; traffic movements.
Other amenities:	Tranquillity
	Urban space (traffic congestion and speed)
	Sense of wilderness.p (30).

The review of past and present planning policies presented in Chapter Seven and chapter eight shows that the Al-Qatif oasis and its settlements have been treated like all other cities in the Kingdom, without consideration of its location in agricultural land. In respect of the development of the location, the master plan and the urban growth boundary laid down did provide guidelines, but there was no study of the impact of the development on the physical and natural aspects of the oasis, and how to manage it.

Several contributors to study in this field - such as Sadler (1996), Selman (1996), Jacobs (1993), Therivel et al. (1992), Wood and Djeddou (1991), Glasson (1994), and Rydin (1998) – have noted the importance of EIA and SEA at national, regional, and local level in a variety of countries such as the USA, the UK, and the Netherlands. In the UK for example the British government recognise the interaction between socio-economic development and the natural environment at all levels from the international down to the local. The application of EIA for proposed major projects, such as roads, new settlements, and facilities, is now widespread in many countries of the world.

B. <u>Factors relating to environmental policies</u>. The review in Chapter Four of environmental policies has shown that the Saudi government has attempted, in the National Development Plans and other documents, to address environmental problems

by drafting policy proposals and introducing legislation to establish a comprehensive body of environmental laws and policies.

The problem has been, as we have seen in Chapter Four and Chapter Eight, that the proposed policies such as those of the Fifth and Sixth Development Plans have not been implemented properly. It is clear that the development process as applied to Al-Qatif oasis and its settlements stills lack EIA. This shortcoming in not implementing EIA has been commented upon by some respondents as the cause of the loss of agricultural land and natural resources in the oasis.

The further point has been made by some respondents that there is a lack of environmental policies, including specific policies in relation to the protection of agricultural land in the oasis, as noted in Chapters Four, Six, and Eight. As we observed, there is no requirement for EA to be carried out before a project is approved and put into practice.

Amongst other problems in Al-Qatif oasis and its settlements that have been mentioned by respondents as caused by the lack of environmentally sustainable land development policies are the growth of stress through water, air, land, and noise pollution, the increasing water table and salinity, as we have already indicated, the lack of such policies applied at local level can, at least in part, ultimately be traced to their lack at MOMRA level, as well as to a lack of understanding of environmental issues amongst local officials.

Nevertheless it has to be recognised that there has been some genuine effort by the Saudi government to formulate policies and standards at national level, and the situation that now prevails in Al-Qatif oasis and its settlements is also due to the failure to adapt and apply at regional and local level such policies as exist, rather than to a complete lack of such policies altogether in the Kingdom. It is also due to the fact that MOMRA lacks sufficient staff who are capable of translating environmental policies into specific plans and programmes, such as the lack of an EIA requirement at local level that we have already mentioned.

This gap which exists between environmental policies at national level and their adaptation and application at local level, such as that of Al-Qatif oasis and its settlements, can be addressed by establishing a new department with responsibility for introducing the mechanisms and tools to lead to the implementation of national policies at local level. As things stand at present MEPA, the body responsible for environmental protection, has no mechanisms to follow up policy proposals.

D. C. Factors related to agricultural and water policies. The review of agricultural and water policies in Saudi Arabia (Chapter Five) indicates that, despite the emphasis placed on the development of agricultural production through the National Plans, this has been largely irrelevant to the needs of smallholdings, which is the typical farming pattern in Al-Qatif oasis and its settlements. The lack of policies appropriate to the needs of smallholders in Al-Qatif in the Fifth and Sixth Plans has increased the loss of agricultural land in the oasis. One way in which this policy deficiency manifests itself is that the conversion of agricultural land to other uses, residential, commercial, and recreational, has been permitted. This is something that has been particularly remarked upon by respondents.

Related to the lack of policies protecting agricultural land is the fact that many of the people living in Al-Qatif oasis and its settlements have found employment in the government sector or in private oil companies, which pay more than the agricultural sector. A further factor is that, with the population growth and the increase in the size of households in Al-Qatif, the price of land that will be given over to residential use has increased with demand. Again, this is a push towards the conversion of agricultural land to other uses, particularly since there is no control other than market forces over the price of land when it changes from agricultural to other use.

The lack of control policies has meant that the residents of Al-Qatif oasis and its settlements have also been known to find various ways to change the use of their land. Some, for example, have let the trees on the land die without taking care of it as they used to, and then sought permission to convert it to other uses on the grounds that it is no longer suitable for agriculture. What is required is the monitoring of the activities of local people when they attempt to change their land from agricultural to residential

or other use, as has been noted by municipal officials. This can be done through a local indigenous organisation, such as that proposed by the present researcher as a unit of the Department of the Environment Such an agency could provide feedback to the authorities to enable them to take appropriate action to halt the loss of the natural resources of Al-Qatif oasis and its settlements and to help it move towards sustainable development.

The condition of agricultural land has also not been helped by the practice of importing trees from outside Saudi Arabia and planting them in Al-Qatif oasis and its settlements. These trees have brought with them some diseases which have caused the death of some of the local trees.

In addition it is noted in Chapter Five that most of the urban development has taken place in areas that are dominated by non-renewable water resources, such as Al-Qatif oasis and its settlements. This is in direct conflict with national policy, which states:

> Investment will be encouraged in areas with large quantities of renewable water resources using modern irrigation systems and consuming low quantities of water. (MOP, 1995, pp. 215-216)

So some of the loss of natural resources in Al-Qatif oasis and its settlements may be attributed to the failure to implement existing national plans.

One contribution which central government could make to improve the situation would be to introduce new policies to encourage smallholders in the country in general and in areas like Al-Qatif in particular. For example loans and technological tools could be provided to help them farm their land, as has been stressed by local officials in the municipalities and by residents living in Al-Qatif oasis and its settlements.

9.3 Integration and Co-operation in Relation to Policies

As has been noted MOMRA is the main body responsible for physical urban development at all levels from national to local, MEPA is the body responsible for the control of pollution and the protection of the environment, and the Ministry of Agriculture and Water is responsible for agricultural and water development.

However, as has been observed in Chapters Four, Five, and Six and has been remarked upon by officials working in the Al-Qatif area, there has been a lack of integration and co-operation between these bodies and this has resulted in the loss of the agricultural land of the oasis and its natural resources.

This lack of integration and co-operation can be specified more precisely in a number of ways. For example, there has been a lack of training in programmes of environmental study and development between the agencies concerned and in guidance about how to use sustainable development tools in practice, and a lack of data exchange amongst them. Figure 6.1 indicates the lack of co-operation at regional and local level between branches of MOMRA and branches of the other ministries on environmental issues in general, and in particular on protection of natural resources. The situation is not helped by the fact that there exist no environmental departments in the *Amanah* as currently constituted; such departments might at least reduce the problems of the loss of the natural resources of the oasis.

Even those environmental policies and study findings which have been established by MEPA are not applied in Al-Qatif. For example, no use is made of comprehensive data on the state of the environment in the oasis, and there is no implementation of EIA or SEA in Al-Qatif oasis and its settlements.

The Fifth and Sixth National Plans state the following in relations to policies, plans, and proposals at a national level:

> . . . taking environmental considerations into account in the various stages of development projects (i.e. planning, design, construction, operation) in all sectors especially the producing sectors of agriculture and industry, whereby all projects shall be subjected to environmental impact assessment. (MOP, 1995, p.410)

This is not something which has been fully implemented. Evidence from the survey carried out in the case study in the municipalities and sub-municipalities together with the existing reduction, even destruction, of the natural resources of Al-Qatif indicate that the planning process has not been integrated fully with environmental assessment. The fact is that there are no official and approved environmental assessment procedures assimilated with the planning process as far as Al-Qatif oasis and its settlements are concerned.

This lack of co-ordination can be attributed at least in part to MEPA, the agency responsible for the protection of the environment as discussed in Chapter Four and especially Section 4.3. One of its functions is stated in these terms:

> Establish environmental standards and specification for pollution control and environmental protection in definite and stable form to be considered by the appropriate authorities when issuing permits for industrial and agricultural projects with a potential environmental impact. (Al-Gilani, 1997, p.253).

Section 4.3, in its review of the main branches of MEPA, has already indicated the responsibilities of MEPA's General Directorate for Environmental Protection (GDEP).

It is supposed to work in close co-operation with MOMRA as the body responsible for physical development, but the latter has, at *Amanah* level, only a general department of environmental health, which simply does not cover adequately the area required (see Section 6.7).

It may indeed be said that the existing legislative framework of MOMRA and MEPA and the existing policies, plans, and programmes at central level simply do not take a comprehensive view of the problems of the oases, even though there is a measure of co-operation and integration for some national projects in terms of data availability and the approval process. At a more local level, such as that of the municipalities, even this is lacking, and the situation has to be addressed if the cause of sustainable development in Al-Qatif oasis and its settlements is to be assisted. The setting up of a Department of Environmental Assessment (DEA), which is proposed and explained

later in this study, aims to help to reduce the impact of the current state of affairs on the natural resources of the oases.

9.4 Participation and Education

As has been demonstrated in Chapter Three Saudi Arabia has improved and developed every aspect of life as a result of the National Development Plans. As elsewhere in the world the exploitation of natural resources, especially in the oases, has been one of the means of realising urban growth. As we have already pointed out very fully, however, one result of all this has been the loss of the agricultural land of the oases and their natural resources (see Chapter Seven and Chapter Eight). The development of the social and physical infrastructure to accommodate urban growth has led to great environmental problems.

In the increasing movement to promote environmentally sustainable development, which we reviewed in Chapter Two, one aspect has been the participation of the indigenous people as supervisors and managers of their own threatened ecosystems. Shelton et al. (1994) and Wood (1995) argue that policies which are based on strict conservation of ecological resources, but which exclude or reduce the contribution of indigenous knowledge, may in fact lead to unpredictable outcomes including the possibility of the destruction of biodiversity.

We have seen in Chapters Three, Four, five, and Six that the Saudi government introduced many policies in relation to physical development and the protection of the environment, which required the setting up of new ministries and agencies to improve the administrative and organisational structure and to distribute policies and powers amongst government bodies in an attempt at decentralisation. The situation faced by planners is related to this; they cannot achieve all their objectives through statutory powers, and so they are faced with the problem of co-ordinating the participation of others in the decision-making process. The mere holding of objectives and formulation of policies alone has not cured the existing problems in Al-Qatif oasis, as we have seen in Chapter Seven and Chapter Eight. The participation of local people

the process is possible in such areas as the identification of problems, the implementation of plans, and the management and maintenance of facilities.

A locally established organisation can play a major part in the sustainable development enterprise through surveying, reporting, and analysing environmental problems such as the destruction of natural resources. Al-Qatif oasis and its settlements would benefit from any encouragement given to the indigenous people to participate in moves leading to sustainable development, particularly if the people were educated in the issues involved in care of the environment and the protection of natural resources of the oasis.

We have noted above that greater local participation is needed, and suggested spheres in which this might take place. The question is, what is required to bring this local participation into force? The answer must be that the drive to greater local involvement should start at the national level, that of MOMRA. It is through MOMRA's efforts that relationships of participation and co-operation must be established at municipality level, both in the Kingdom in general and in the oases in particular. This is not only because, in order to function efficiently, policies, plans, and programmes require implementation by local authorities and individuals, but also because these local contacts are in a position to provide feedback on the operational success of policies, plans, and programmes and the impact these are having on the local environment much more than can centrally-based officials and committees remote from the scene.

If participation can be viewed in this way, as working not only from top to bottom but also from the local to the national level (bottom up), then organisations can be developed under the *Amanah*. Their activities can complement those of government bodies and they can participate in raising the awareness of local people in environmental issues and in educating them about the monitoring of natural resources in Al-Qatif oasis, as well as providing feedback as noted above. Local organisations concerned with the attainment of sustainable development can carry out such a remit by holding public meetings in various settlements of Al-Qatif oasis and visiting sites

deemed to be at risk environmentally. They can, in other words, help the government to be more caring at local level.

Local organisations set up by the government in the way described above would, of course, require appropriate legal powers, adequate training, and sufficient technical assistance. The establishment of such organisations controlled by a DEA and under the *Amanah* is one of the major proposals of this thesis.

We have touched upon the need to educate the public and to raise their awareness of environmental issues. This must be viewed as one of the keys to sustainable development, since without public awareness and concern about environmental matters the co-operation of the people would be lacking and most development and environmental policies, plans, and programmes would have only limited success. We have seen in Chapters Three, Six, and Eight that the Saudi government has indeed introduced policies related to greater public awareness of and education about environmental issues. However, these admirable policies have not been comprehensively implemented locally, so that in the case of Al-Qatif oasis there is still a need to raise the profile of environmental matters in the minds of the indigenous people. Indeed the lack of appreciation on the part of local inhabitants of environmental issues, natural resources, and national policies in this sphere was noted from their attitude towards agricultural land and from the interviews held with them. A high percentage of the respondents did not even know what sustainable development means. Greater appreciation amongst ordinary people about sustainable development, the environment, and the threat to natural resources is required before appropriate co-operation can be expected from them.

The responses of officials working in the municipalities and of residents of Al-Qatif oasis and its settlements made it clear that one obstacle to the raising of awareness on environmental issues was the lack of operational mechanisms to implement the policies that already exist at national level. There is thus a symbiotic relationship between public awareness of environmental issues and the implementation of policies that relate to them: awareness is low partly because the tools to implement plans do not exist locally, and the tools to implement plans are lacking partly because the

public are indifferent, through lack of education, to environmental concerns. This is an area where the proposed DEA could have a crucial role to play. The DEA could both instigate and maintain local implementation mechanisms, and also establish and manage local education schemes to raise awareness of the issues involved.

Education and a higher public profile are therefore factors which need to be addressed, along with the other issues such as greater co-operation between MOMRA, MEPA, NCWD, and MOA, to lead to successful attainment of sustainable development in Al-Qatif oasis and its settlements. This raising of the profile of environmental concerns is not something that can be achieved through one single approach or one single publicity move. Welcome as it was, therefore, the Tree Week campaign of the *Amanah* and the municipalities is not enough on its own; further campaigns are necessary in order to achieve the desired goal of making the public in Al-Qatif aware of the threat to the natural resources of the oasis.

One organisation already in existence which could play a greater part than it does at present in raising public understanding of the issues involved in urban and physical development is Al-Amra bil Maroof Wal Nahi Anil Moniker (OOABNM) – which means in English 'organisation for commanding good and forbidding wrong'. This organisation could co-operate with the proposed local organisation in Al-Qatif in terms of providing the organisation with qualified staff who can introduce the importance of the protection of trees and other natural resources of the oasis according to the insights of Islam, through public lectures and seminars.

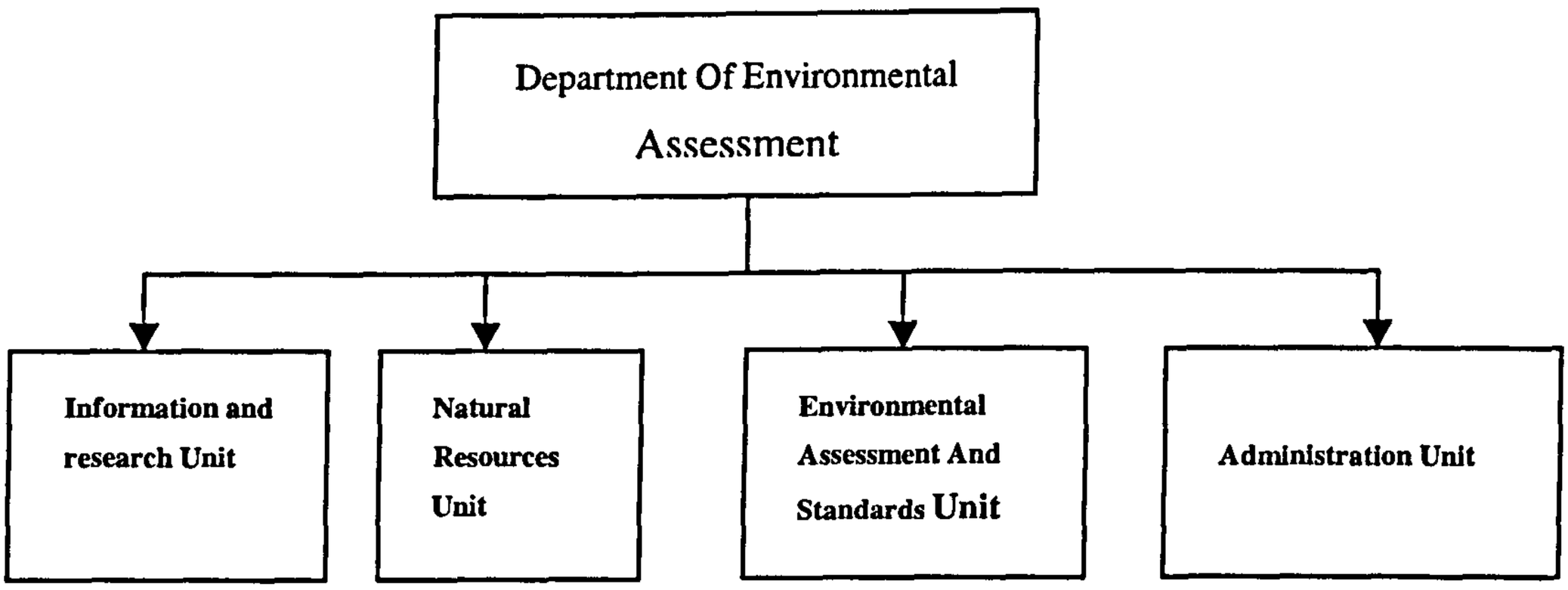
In Chapter Eight and the first part of this chapter we looked at the main factors which have acted as obstacles to sustainable development in Al-Qatif oasis and its settlements. The second part of this chapter has proposed guidelines and solutions to tackle this problem and to lead towards sustainable development in the area.

9.5 Aiming for Sustainable Development in Al-Qatif Oasis and its Settlements

We have already proposed that there should be established an additional department within the existing institutional framework of the *Amanah* which could play a major role in implementing such environmentally friendly policies as exist at national level, and in this way head towards sustainable development.

Chapters Seven and Eight have indicated that, while the existing policies on physical development, agriculture, and the environment have been carried out in the country in general and Al-Qatif oasis in particular, this has in fact resulted in a negative impact. The reason for this is that the raft of policies pursued by the government and its agencies has not included a comprehensive sustainable development policy. Or perhaps it is because the present policies just have not been implemented properly at local level.

The following figure shows the possible structure of an environmental department within MOMRA at the *Amanah* level, such as has been proposed above in this chapter:



The position of the *Amanah* is very important in relation to the establishment of the DEA. The *Amanah* occupies an intermediate position between MOMRA at national level and lower municipalities beneath it in the administrative structure of the country, so that it has access both to MOMRA and to the local administration; it can therefore

form a bridge between them and facilitate at local level the implementation of policies, plans, and programmes formulated at national level.

As can be seen from the chart above the proposed department will consist of four units:

1. An information and research unit
2. A natural resource unit
3. An environmental assessment and standards unit
4. An administrative unit.

The functions of these units will be as follows:

1. Information and Research Unit

- To provide information about the local environment (air, water, soil).
- To collect information from other government ministries, agencies, and local organisations.
- To classify the information collected in a hierarchical way according to the size (cities, villages, oasis settlements).
- To conduct appropriate research into the existing problems in relation to the activities of the municipalities.
- To produce a programme of future research to facilitate the activities of the municipalities.

2. Natural Resources Unit

- To study and assess the impact of physical development on the natural resources in the cities, settlements and oases.
- To produce mitigation measures to preserve and protect natural resources.
- To produce periodic reports about the state of the environment at local level.

3. Environmental Assessment and Standards Unit

- To assess policies, plans, and programmes at the local level to ensure compliance with the national environmental policies and sustainable development policies.
- To produce environmental standards derived from national standards
- To assess and monitor commercial, residential, and industrial activities which may affect the environment at local level.
- To provide guidelines and feedback to the national level.

4. Administration Unit

- To co-operate with other local government agencies, such as indigenous organisations.
- To provide training programmes internally for officials working in the municipalities and externally to members of the community and to officials of other government branches at local level and to other local organisations.
- To provide programmes for the public, designed to raise environmental awareness and participation, such as seminars, conferences, media contributions, and workshops.

The DEA will be the principal environmental body in MOMRA responsible for protecting and maintaining the general environment in the rural and urban areas of the Kingdom, and for preserving its natural resources in particular. It should be authorised to implement the national environmental policies, to set goals and objectives, proposing policies, plans, and programmes, and to assess its master plan, land use plans, and so on. In co-ordination with local branches of other ministries, it should be responsible for setting environmental standards and monitoring environmental conditions in urban and rural areas. Its powers should include the authority to inspect sites and activities, and to collect information within official boundaries.

The department should have the authority to take appropriate action, including the imposition of penalties, and should be empowered to present an annual report to the

ministry and the public on the state of the local environment, detailing assessment of its condition and the extent to which adopted policies have been implemented.

The DEA's remit should also include providing the means to put into practice the policies, plans, and programmes of MOMRA in a more sustainable way through co-operation with other ministries and agencies involved in physical development and environmental protection. Where a gap is seen in the implementation of these policies, the department should fill this gap and where there is perceived to be a lack of appropriate policies in a particular sphere relating to environmental protection or a lack of the means to carry them out, the DEA should report this to MOMRA and point out the impact of the situation on the cities and oases of the country, including Al-Qatif oasis and its settlements.

The department should provide the means of implementing the policies, programmes, and plans of MOMRA in a more sustainable way in co-operation with other ministries and agencies involved in physical development and environmental protection. It should report the lack of these policies or the means to implement them to MOMRA, thus filling the gap in the present system. It should also provide input about the impact of these policies on the cities involved in general and on Al-Qatif oasis in particular.

As an example of the role of the DEA, public and private bodies requesting a development licence from the *Amanah* (municipality), the main authority for the approval of physical development proposals in Al-Qatif oasis and its settlement, should be required to accompany their applications with environmental impact statements of their projects checked and approved by the DEA as a part of the licensing procedure (see Figure 9.9). Furthermore, MOMRA at the national level should require the municipalities to review and assess their master plans and land use policies, so that the importance of protecting and rehabilitating the environment is given more consideration. In addition, the DEA should integrate EIA and SEA into all the municipality master plans and land use plan processes.

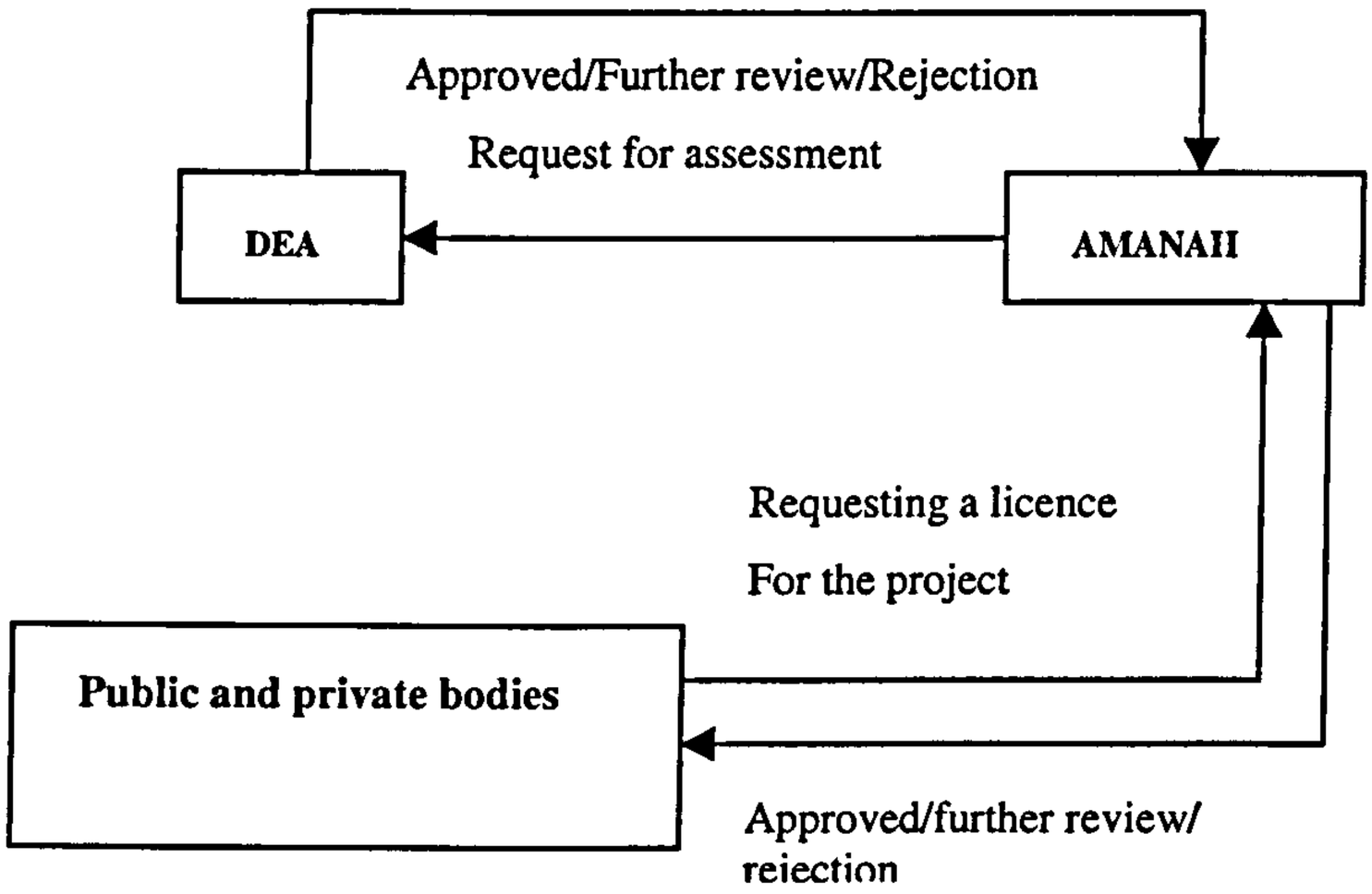


Figure 9.9. Proposed path of approval of the development projects in Al-Qatif oasis.

MOMRA should also require environmental assessment for the *Amanah* plans and planning studies to be carried out in the oasis before they give approval to them (see Figure 9.10).

It has been noted that the existing loss of the natural resources of the Al-Qatif oasis and its settlement has resulted from the lack of integration of environmental assessment in the planning process used by the municipality responsible for the development of Al-Qatif oasis. This can be reduced through the establishment of the DEA as explained above in this chapter. The integration and the methodology of implementing DEA for the plans, policies and programmes is a very effective and simple task, which is in urgent need. In the care of Al-Qatif oasis the existing environmental and development policies at the national level could be used as the main source of assessment. Such policies include development plans, Agenda 21 Saudi Arabia, and other governmental documents.

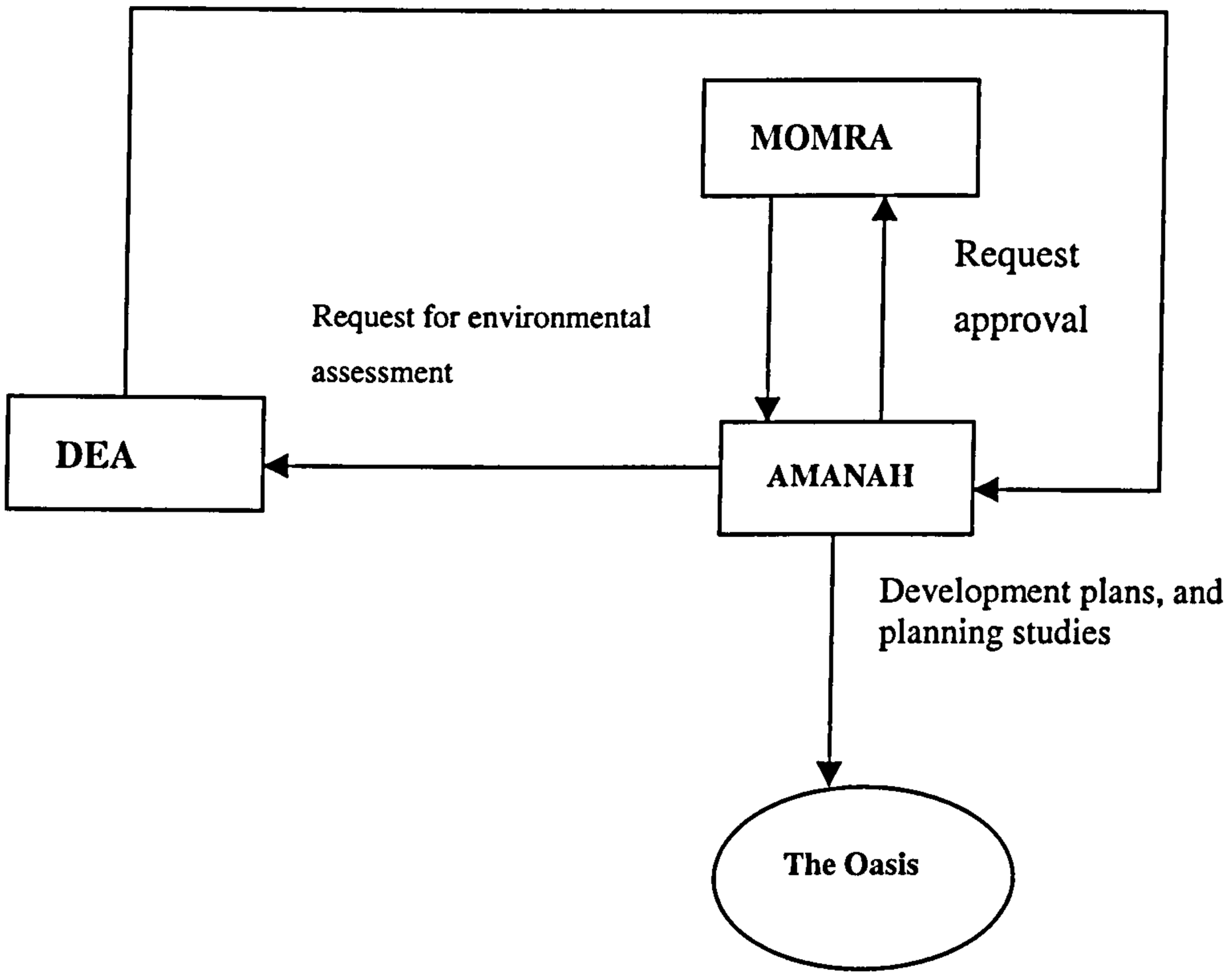


Figure 9.10. Proposed process of environmental assessment of the municipality plans and studies to be implemented in the oasis.

In addition, planning for sustainable development can be achieved through the requirement by the DEA in the *Amanah* of a State of Environment report (SOE) in Al-Qatif oasis and its settlements, which is an essential basis of any attempt to plan for sustainable development. Jacobs (1993) stresses that plans for sustainable development must rest on basic information about local qualities and conditions.

We have noted in Chapter Four that the government of Saudi Arabia through MEPA, the responsible body for environmental issues, has produced a state of the environment (SoE) report for all Saudi Arabia, which is general, useful information on the state of the environment in the kingdom overall. However, it was lacking specific local application. The DEA, therefore, should provide one at its level, that of the oasis and its settlements. This could be a starting point to help private and public developers to base their planning decisions on an understanding of the local environment.

This starting-point information from the SoEs at the national level could help to provide guidelines to produce a report at the level of Al-Qatif oasis and its settlements, addressing some topics in relation to its resources as discussed above in this chapter.

The SoE report is a very important source in planning for sustainable development. The DEA may produce and publish an annual SoE report, in co-ordination with MEPA and other agencies, about the Al-Qatif oasis. This report could contain comprehensive data and up-to-date information about the environment and the extent to which environmental policies are implemented.

The DEA, as we have noted, can help local groups to improve the level of education, awareness, and participation in relation to the environment.

We have noted the lack of specialised staff in the field of environmental assessment at the central and local level. The department at the municipalities level needs trained staff who can produce sound practices and production, and who can undertake its activities. The current lack of such personnel results in the lack of implementation and of sustainable development policies and programmes and plans at Al-Qatis oasis. This in turn results in the final stage, the loss of the agricultural land of the oasis as an important resource. This could be limited by providing the proposed DEA with enough specialised staff in the environmental field, researchers from the university, and other governmental staff (from MEPA and MOA). This would help when assessing the municipality plans, programmes, and policies and would help in facilitating the MOMRA plans and policies at the municipality level.

9.6 General Conclusion

Achieving sustainable development is the aim of most countries. This thesis has attempted to study and assess the Saudi national policies in the field of urban

development and growth, and the protection of the environment in general and the protection of Al-Qatif oasis (and its natural resources) in particular.

The research has taken as its starting point the loss of the agricultural land of the Al-Qatif oasis and its settlements as a very important natural resource, as a result of the rapid development carried out in Saudi Arabia in general and Al-Qatif oasis in particular through the last three decades. The researcher has been concerned to indicate the manifestations of the loss to elicit the causes of the loss of the agricultural land of Al-Qatif oasis and the lack of sustainable development in the oasis, and to offer guidelines aimed at eliminating or reducing the current loss of all the natural resources of Al-Qatif oasis. He has sought to provide guidelines for sustainable development in Al-Qatif oasis and its settlements.

Achieving sustainable development also requires reviewing and assessing how other countries prepare and implement sustainable development policies, tools, and methodologies. Chapter Two offers a historical overview of the concept and evolution of sustainable development in different countries. In addition the Islamic perspective on the concept of sustainable development, identifies and defines SEA as a tool to achieve sustainable development.

It has been shown that environmental assessment is a very important issue to be considered when planning for development. Chapter Two of this thesis gives the UK government as an example to illustrate the use of SEA and EIA in plans , policies and programmes in order to achieve sustainable development. It is concluded that it is a major issue in the UK central government and it has started to be adopted and implemented in the local authorities in the UK under the control of the Department of the Environment. It was noted that integrating SEA in the government plans, policies, and programmes is a very important matter, which may lead to sustainable development.

The review in Chapter Three aims to introduce the importance of the oases in general. It reviews the national development policies, objectives and plans to understand and highlight their impact both positively and negatively on the physical development and

on the environment, and to understand to what level they have an impact on the Al-Qatif oasis and its settlements. The lack of comprehensive policies in the field of urban growth policies, environmental policies and agricultural policies at the national level has contributed to the loss of the agricultural land of Al-Qatif oasis and its settlements.

Chapters Four, Five, and Six review the national environmental, agricultural and water, and physical planning policies, and the governmental agencies and ministries involved in physical development and in environmental protection. This shows the context of the environmental policies, which started after Fifth National Development Plan when the government began to recognise the need for environmental policies and administrative structure to deal with the environmental problems in general and natural resources in particular. The review shows that the existing environmental policies, plans and programmes introduced by the government in relation to the protection of the agricultural land of the oasis are still in general and not specific. In addition to that the existing policies in respect of implementing sustainable development at the oasis still relate to the national level only. The lack of an EIA requirement in project application and implementation is one piece of evidence for this, as is the failure to apply SEA to the municipalities' plans and policies and programmes. This has contributed to the loss of agricultural land in Al-Qatif oasis and its settlements in particular and to the general state of the environment in the oasis.

The review of the agricultural and water policies stresses another point which has contributed to the unsustainable development in the oasis, and that is the clear interest in large agricultural enterprises rather than in small farms, though most of the agricultural land of the oasis is small farms.

Another point is the overuse of non-renewable water resources, partly because of agricultural concerns, and partly because it is in areas with non-renewable water resources that most urbanisation has taken place. This has led to the situation where the supply of water for domestic, industrial, and agricultural purposes may be threatened within a few years. It is clear that the huge amount of consumption has led directly to negative environmental consequences. Salinisation in areas near the sea

and the increase in the area of fresh water/salt water interface have meant not just inconvenience for human water users, but that the ecological balance of some areas has been threatened, and there has been a basic change in the relationship of man to the natural environment. Priority has been given to supplying water to large agricultural enterprises, as well as to domestic and industrial users, with corresponding shortfall of suitable irrigation provision for areas unable to wield enough influence, including the oases.

The review in Chapter Six discussed the role and policies of MOMRA, which is the main ministry responsible for physical development. This includes the policies stated in the Five Year National Plans, and other government publications and policy documents. The chapter assesses the MOMRA policies and its initiatives taken in matters relating to physical development and environmental improvement, and land and natural resources preservation for the generations of the future. It is concluded that there is a lack of comprehensive environmental consideration in the process of urban development from initial provision of land right up to the construction of buildings on it, where the impact of physical development on the environment and natural resources is acknowledged.

A further obvious point is the lack of environmental assessment in the preparation and application of master plans and other planning studies in general, and relating to Al-Qatif oasis in particular. This has contributed to the lack of sustainable development in the oasis and its settlements.

The lack of a department for environmental assessment in the MOMRA institutional framework is another factor which has detracted from sustainable development. Along with the lack of enough staff specialised in the issues of sustainable development and environmental matters, this has contributed to the failure to implement national policies in relation to the environment at the local and oasis level.

Furthermore there is insufficient environmental appraisal and assessment of MOMRA plans, policies, and programmes.

We have also seen that the local awareness of and participating in such issues as sustainable development in general and within Al-Qatif oasis is limited. The lack of participation of the public in the planning process and in the developmental process is one obstacle to achieving sustainable development. The failure to establish indigenous local organisations in Al-Qatif oasis, which could help in the developmental and environmental protection, has contributed to the lack of education and awareness of the local people about the sustainable development problem and the threat to the next generation. The lack of comprehensive policies which require education is one of the very important points.

The lack of comprehensive integration and co-operation between the different governmental agencies involved in physical development and environmental and natural protection is a further factor involved in the reduction of the general environmental and natural resources in Al-Qatif oasis.

The AL-Qatif oasis and its settlements as a case study show that the impact of the current lack of these factors at the national and local levels has resulted in the reduction of natural resources (agricultural land).

The features of the national policies relating to agriculture and water, the environment, and physical planning, have been assessed to find their impact on sustainable development in AL-Qatif oasis and its settlements.

Through the research conducted it was noted that the following factors have resulted in development that could not be sustained in Al-Qatif oasis and its settlements:

- The lack of comprehensive environmental assessment in the municipalities in the projects involved in physical urban development in Al-Qatif oasis.
- The lack of comprehensive sustainable development policies at the level of Al-Qatif oasis and settlements.
- The lack of a requirement of EIA before issuing any development licenses.
- The lack of specialised staff in environmental planning.
- The lack of a department specialising in environmental assessment.

- The lack of education about the importance and the issues of the concept of sustainable development among the local people and officials.
- The lack of comprehensive co-operation between MEPA, MOA, and MOMRA branches at the local level in the issues of protecting the natural resources of the oasis.
- The lack of awareness of the local people about the natural resources of the oasis.
- The lack of comprehensive agricultural policies which encourage the people to protect their agricultural land in the oasis.
- The lack of comprehensive implementation and adoption of the national policies in relation to the environmental and natural resources in AL-Qatif oasis.
- The limited role for the public in the oasis in the development and protection process.

All these points have increased the rate of destruction of the agricultural land of the oasis and resulted in development that could not be sustained.

Chapters Eight and Nine attempt to assess and discuss these factors and to propose guidelines for reducing the problems and to help to change the way towards more sustainable developments in the oases.

The proposed Department of Environmental Assessment will play an important role in achieving sustainable development in Al-Qatif oasis and its settlements. By liasing between national and local level, the department should act as the implementing body of physical development and the protection of natural resources in the oasis. It should act as a means of co-ordination and integration between different government policies and programmes, and it should be a tool to integrate public participation in the development process by establishing indigenous local organisations in the DEA. This would improve education, awareness, and participation in sustainable development in Al-Qatif oasis and its settlements. Teachers could encourage positive attitudes towards the environment in the younger generation.

Furthermore the DEA should act as a means whereby the national level of MEPA, MOMRA, and MOA can have feedback form the local level (the oasis) as to the weaknesses of their policies and the areas which need to be covered.

The perceived gap can also be filled by adopting national environmental, agricultural and water policies, and national urban and physical policies. The oasis issues in general need to be reconsidered and assessed by MOMRA and MOA, and the requirement for EIA and SEA in physical planning processes is one point which is in urgent need.

MOMRA should require EIS for the projects which need to be approved.

There is also a need for the training of officials working in MOMRA at the national and local levels about the issues of sustainable development and its tools. This can be done through training programmes, workshops, and seminars.

Co-operation is needed between MOMRA, MEPA, and MOA to introduce media programmes about sustainable development both in general and in the oasis area and its settlements, and how to consume natural resources in a sustainable way.

The provision of a guideline for the environmental appraisal of local physical development plans and the activities of the municipalities by MOMRA should be a very important factor. This could help toward achieving sustainable development.

The imposition of a compulsory submission of SEA by MOMRA on its municipalities would also be a decisive factor in preventing the degradation of environmental and natural resources.

9.7 Recommendations

The recommendations to deal with the achievement of sustainable development in Al-Qatif oasis and its settlements are linked to the factors that contributed to the loss of

the natural resources of Al-Qatif oasis, in particular the agricultural land. These factors, as revealed by the present research, are national policies, that is MEPA, MOMRA and MOA policies, programmes, and plans, integration and co-operation in the matter of the policies and the government institutions, and education and participation of officials and the public.

The various recommendations are on two levels, the national and local. They are intended to deal with shortcomings of the existing policies in relation to the oasis issues, to reduce the existing impact on the agricultural land of the oasis, and finally to reach the sustainable development in Al-Qatif oasis and its settlements.

At national level the government ministries and agencies responsible for development and environmental protection, such as MOMRA, MEPA, and MOA should introduce sustainable development policies for issues such as the oases in the Kingdom in general and Al-Qatif oasis in particular. This will consist of plans, policies and programmes, which take into consideration the location of the oases, its topography, geology and environmental and ecological aspects, which are completely different from other cities or settlements in the kingdom.

SEA should be applied by MOMRA to its plans, programmes and policies, with the co-operation of MEPA and MOA. The existing and future plans should be evaluated and assessed in terms of their environmental impact before they go to the stage of implementation.

At local level MOMRA should establish DEAs at its *Amanah* (municipalities) as introduced in this thesis. These departments should be able to contribute to sustainable development in the oases. Physical planning policies and tools used by MOMRA such as master plans, its land use plans, policies and urban growth boundaries need to be evaluated and assessed from time to time to determine their impact on the natural resources of Al-Qatif oasis and other oasis areas.

MOMRA, in co-ordination with MEPA, should establish guidelines on how to carry out environmental appraisal of their plans at the *Amanah* level, such as those produced

by the UK government and discussed in this thesis. Such guidelines could be as follows:

A. Identifying environmental stock resources that are not always replaceable and may be affected by the plan, in any area planned to be developed. For example, the municipality, before producing planning studies such as master plans, land use plans for development in any area in general and in Al-Qatif in particular, should identify such environmental stock. This can be done by the DEA guided by the guidance which should be produced by MOMRA and MEPA, or could be by the DEA in the municipality. In general this can be carried out using the existing state of the environment reports (SOEs) produced by MEPA as starting points and producing one at the local level of the oasis.
B. Identifying environmental issues that require more attention in the plan, and ensuring that the plan is consistent with relevant national policies and guidelines produced by other ministries and agencies concerned with the environment, for example the environment policies in the National Development Plans, Saudi Agenda 21 and other documents. These should be used to put the environmental agenda at the core of the plan-making process to provide consistency with central government policy, and to set standards and targets for use in the plan.
C. Assessing and appraising the plan content: The impact of each policy of the plan on each aspect of the environmental stock should be identified in a simple policy/impact matrix, with the policies on one axis, and the environmental stock on the other, where each cell in the matrix confronts one policy with one aspect of the stock. This can help to record whether there is a positive or negative impact.
D. Presenting the assessment: The methodology and the result of the assessment should be presented to both central and local government in an informative way, and also to the public through local organisations and government agencies. These might include universities, schools, newspapers, and other media. This could help in the issues of education, awareness and participation.

It is further recommended that the DEA should help in establishing indigenous local organisations staffed by officials from the local branches of MOA and MEPA, and by the public, university personnel, and representatives of the religious authorities. They should be supervised by the DEA and linked to the municipality. This will improve

the public participation, education and awareness in all oasis settlements, including Al-Qatif. Local organisations also offer a means to report on and monitor the existing environmental and natural resources to the DEA.

It is recommended that municipalities should require environmental impact statements (EISs) for every project development before issuing the licences for development to take place. This will help in anticipating the environmental impact of the projects. This could be a requirement of the DEA.

Other recommendations include MEPA involvement in the provision of policies, plans, and programmes for the oasis issues. For example, a SOE report of the Al-Qatif oasis should be provided annually, based on the national pattern.

In the case of Al-Qatif, municipalities should produce, through the DEA, SOE reports in collaboration with MEPA and MOA branches, which would have a very important influence on the environmental assessment process.

Municipalities should be required to review their waste plans and land use policies, and other planning activities in the oases, including Al-Qatif oasis and its settlements, in collaboration with other government authorities directly concerned with environment and natural resources, such as MEPA and MOA branches, to ensure that future activities are environmentally sustainable; this can be done through the local DEAs.

Municipalities, through the DEAs, should establish a set of sustainable development indicators by which sustainable development in the oases, including Al-Qatif oasis and its settlements, is measured and monitored.

MOMRA, MEPA, and MOA should produce special information programmes and a campaign about development and environmental protection in general, and the sustainable development of Al-Qatif oasis and other oases should be carried out through the media, schools, and religious authorities.

Education sectors can play a very important role in the delivery of sustainable development in the Kingdom of Saudi Arabia, the oasis areas as a whole, and Al-Qatif oasis and its settlement. The Ministry of Education could introduce the topic as a subject to be studied in schools to make the younger generation understand the issues of sustainable development and grow with it.

9.8 Suggestions for Further Research

This thesis has focused in a broad way on the national policies and other factors related to the loss of oasis land as a valuable national resource in Saudi Arabia, and how development in that country has taken place in an unsustainable way.

This study provides a platform for research in some of the areas in need of further examination. The environmental impact of the corniche project, the effect of the UGB and of national spatial strategies on Al-Qatif oasis, and the role of municipalities in the environmental assessment of plans and activities are all areas which suggest themselves. Additional study would also prove useful into the role of the Regional Councils in development decision-making in the oases of the Kingdom. Other areas which would benefit from investigation are the effect of providing local organisations to play a part in the protection and development of the natural resources of the oases, or the potential of other tools, such as the expansion of tourism, to sustain the development of oasis areas.

This research has highlighted relevant factors and has proposed guidelines to bring attention to the way of sustainable development for oasis areas, like that of Al-Qatif, which are rich in natural resources that need to be preserved for the use of this generation and those which succeed it.

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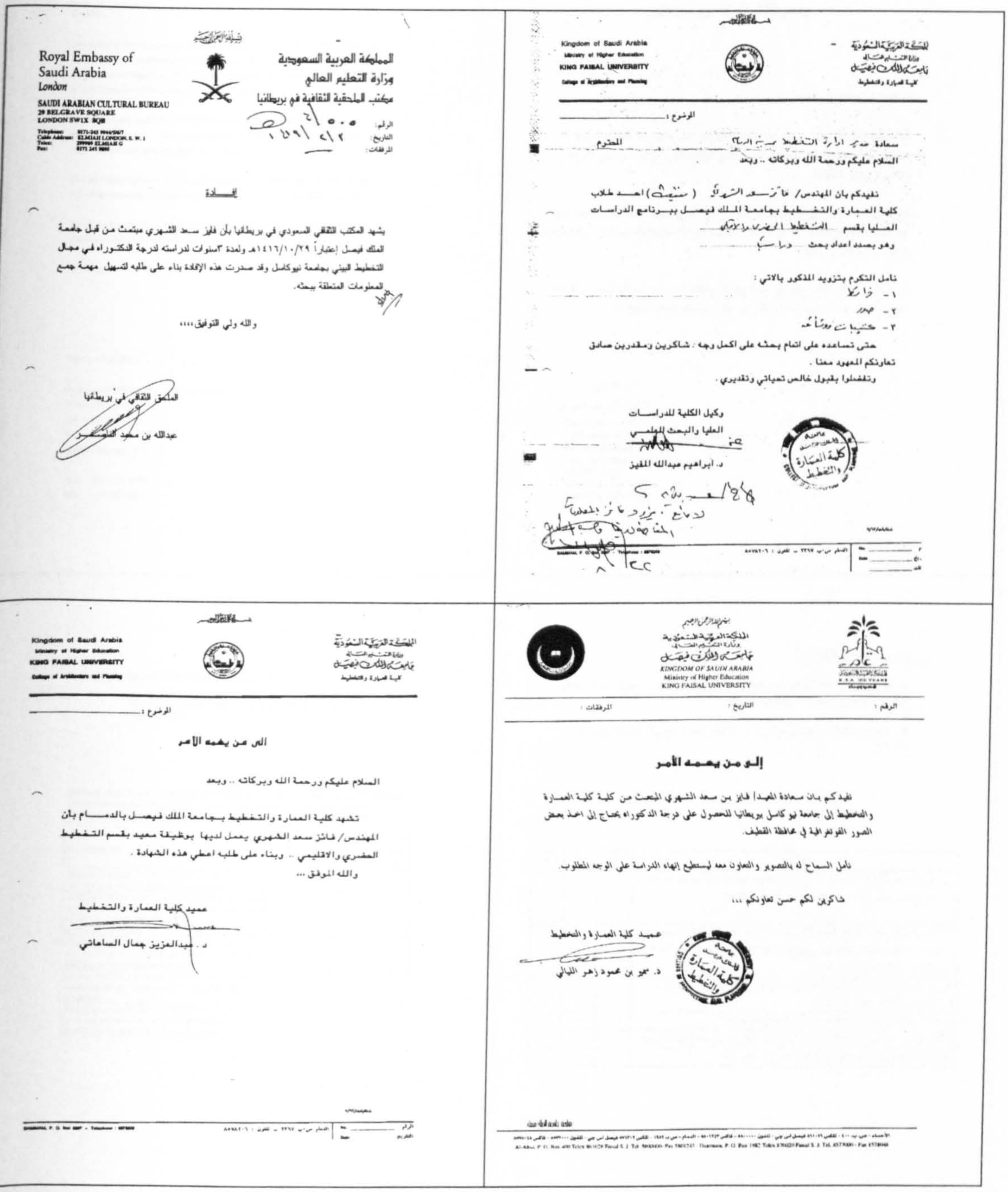
Appendices

Appendices

Appendix I



Royal Embassy of Saudi Arabia
London

SAUDI ARABIAN CULTURAL BUREAU
29 BELGRAVE SQUARE
LONDON SW1X 8QB

Telephone: 0171-245 9944/5967
Cable Address: ELMIAH LONDON, S. W. 1
Telex: 299999 ELMIAH G
Fax: 0171 245 9696

المملكة العربية السعودية
وزارة التعليم العالي
مكتب الملحقية الثقافية في بريطانيا

الرقم: ٥٠٠/ ق/ ١٥٩
التاريخ: ١٤١٦/١٠/٢٩
المرفقات:

إفـــادة

يشهد المكتب الثقافي السعودي في بريطانيا بأن فايز سعد الشهري مبتعث من قبل جامعة الملك فيصل إعتباراً ١٤١٦/١٠/٢٩هـ ولمدة ٣سنوات لدراسته لدرجة الدكتوراه في مجال التخطيط البيئي بجامعة نيوكاسل وقد صدرت هذه الإفادة بناء على طلبه لتسهيل مهمة جمع المعلومات المتعلقة ببحثه.

والله ولي التوفيق،،،

الملحق الثقافي في بريطانيا

عبدالله بن محمد الفاضـــل

Kingdom of Saudi Arabia
Ministry of Higher Education
KING FAISAL UNIVERSITY
College of Architecture and Planning

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
كلية العمارة والتخطيط

الموضوع : _____

المحترم _____ سعادة مدير ادارة التخطيط بمدينة الرياض

السلام عليكم ورحمة الله وبركاته .. وبعد

نفيدكم بان المهندس/ فائز سعد الشهري (مبتعث) احد طلاب كلية العمارة والتخطيط بجامعة الملك فيصل ببرنامج الدراسات العليا بقسم التخطيط الحضري والاقليمي وهو بصدد اعداد بحث دراسي

نامل التكرم بتزويد المذكور بالاتي :

١- خرائط
٢- [illegible]
٣- كتيبات ونشرات عنه

حتى تساعده على اتمام بحثه على اكمل وجه . شاكرين ومقدرين صادق تعاونكم المعهود معنا .

وتفضلوا بقبول خالص تحياتي وتقديري .

وكيل الكلية للدراسات العليا والبحث العلمي

د. ابراهيم عبدالله المفيز

كلية العمارة والتخطيط

الرقم : _____ التاريخ : _____ المرفقات : _____

بسم الله الرحمن الرحيم
المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING FAISAL UNIVERSITY

إلى من يهمه الأمر

نفيد كم بان سعادة المبعد/ فايز بن سعد الشهري المبتعث من كلية كلية العمارة والتخطيط إلى جامعة نيو كاسل بريطانيا للحصول على درجة الدكتوراه يحتاج إلى اخذ بعض الصور الفوتغرافية في محافظة القطيف.

نامل السماح له بالتصوير والتعاون معه ليستطيع إنهاء الدراسة على الوجه المطلوب.

شاكرين لكم حسن تعاونكم ،،،

عميد كلية العمارة والتخطيط

د. سمير بن محمود زهير الليالي

Kingdom of Saudi Arabia
Ministry of Higher Education
KING FAISAL UNIVERSITY
College of Architecture and Planning

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
كلية العمارة والتخطيط

الموضوع : _____

الى من يهمه الأمر

السلام عليكم ورحمة الله وبركاته .. وبعد

تشهد كلية العمارة والتخطيط بجامعة الملك فيصل بالدمام بأن المهندس/ فائز سعد الشهري يعمل لديها بوظيفة معيد بقسم التخطيط الحضري والاقليمي .. وبناء على طلبه اعطي هذه الشهادة .

والله الموفق ...

عميد كلية العمارة والتخطيط

د. عبدالعزيز جمال الساعاتي

Administrative letters from King Faisal University (the sponsor), from the Saudi Arabian Cultural Bureau in London, and from the researcher to help the researcher gather the required data for the present research.

Appendices

Dear Sir

The attached questions form an important part of my PhD thesis in Town and Country Planning which I am working on in the United Kingdom on the topic of 'Planning and Sustainable Development'. The abstracts before each set of questions/statements give a brief description of the intent and focus of my research.

I would sincerely appreciate your help by answering the questions in the enclosed questionnaire before we meet. Your honesty, sincerity, and diligence are greatly appreciated as well as being critical to my research.

The information gathered through this research should provide some insight into the role of environmental planning and its significance in Saudi development success.

Thank you for you co-operation and your valuable time. I want to assure you of respondent anonymity and confidentiality.

Cordially,

Fam: Saad Al-Shihri

Department of Town and Country Planning
Claremont Tower
Newcastle University
Newcastle upon Tyne
United Kingdom NE1 7RU

Tel: 0191 222 5409
Fax: 0191 222 8811

بسم الله الرحمن الرحيم

السلام عليكم ورحمة الله وبركاته ..... وبعد

هذا الاستبيان هو جزء رئيسي من أطروحة الدكتوراه التي أقوم بأعدادها في مجال "التخطيط للتنمية المستدامة" في المملكة العربية السعودية. والمطلوب الرفق قبل العبارات بعطي وبشكل مختصر ومحدود البحث والدقة منه.

أخي الكريم، إن إجابتك على الأسئلة المرفقة سيكون لها بالغ الأثر، لذا أرجو منك التفضل بالإجابة عليها حتى يتحقق الهدف المنشود من هذا البحث بإذن الله. علماً بأن الإجابات في هذا الاستبيان سيتم استخدامها في أغراض البحث العلمي فقط.

أخي الكريم أشكر لك وقتك الثمين مع تعاونك وتفضلك بالإجابة على هذا الاستبيان والذي آمل أن يتم الصالح العام، راجياً منك قبول شكري وتقديري. والسلام عليكم ورحمة الله وبركاته ،،،

أخوكم

الباحث فاز سعد الشهري
Fam: Saad Al-Shihri
Department of Town and Country Planning
Newcastle University
Newcastle upon Tyne
UK NE1 7RU
Tel. 0191 - 222 5409
Fax. 0191 - 222 8811

Development and the Environment in Islam

Islamic law and teaching provide a message covering various aspects of life

Please read the following statements and in each case chose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the development and the environment in Islam.

Statements	*Yes*	*No*	*Do not know*
Islamic law and teaching does not include and emphasise the concept of sustainable development.			
Islamic law and teaching, through the Quran and the Hadith provide a comprehensive framework for the protection of the environment.			
Islamic law and teaching encourage the planting of trees.			
The practice of sustainable development and environmental protection goes back to the time of the prophet Mohammad (PBUH).			
Islamic teaching and law prohibits and rejects the unnecessary and uncontrollable squandering of natural resources.			
Development policies and environment protection policies are based on the understanding of the Quran and Hadith in the Kingdom of Saudi Arabia.			

١ – التنمية والبيئة في الإسلام :

من المعروف بان الإسلام هو دين الفطرة .. ودين شامل كامل .. حيث يحوي بيان كثير من العلاقات المرتبطة ببعضها البعض.

اقرأ العبارات التالية واجب بنعم أو لا أو لا أعلم حسب مفهومكم للتنمية والبيئة في الإسلام.

العبارات	نعم	لا	لا أعلم
١. الشريعة الإسلامية لم تعتبر المفهوم التنمية والبيئة وهو المفهوم الذي يطالب ترشيد استخدام الموارد وتجنب الأضرار بالغير ومراعاة مصالح أبناء هذا الجيل والأجيال القادمة.			
٢. إن الشريعة الإسلامية ومن خلال القرآن الكريم والسنة النبوية وضعت تصوراً شاملاً للبيئة تعتبر الإنسان والحيوان والنبات والجماد والماء والهواء وجعل الإنسان مكرماً على سائر المخلوقات التي سخرت له، انطلاقاً من قاعدة الاستخلاف.			
٣. رغب الإسلام في غرس الأشجار وان ذلك صدقة جارية عندما يأكل منها الإنسان أو الطير أو البهيمة، وبين الثواب الجزيل لمن يقوم بها.			
٤. تعود تعليمات أو طرق حماية البيئة إلى عهد الرسول صلى الله عليه وسلم.			
٥. الشريعة الإسلامية حرمت الإسراف والإفساد في الأرض، كالإسراف في استخدام الموارد الطبيعية.			
٦. سياسات التنمية وحماية البيئة مستمدة من فهم كتاب الله وسنة رسوله.			

English and Arabic questionnaire and structured interview format..

Appendices

Sustainable development

The 20th century has witnessed a huge development in each sector of life. Through this century there has arisen a very serious threat to the environment through the rapid utilisation of natural resources. The pace of population growth, third world poverty, and the rate at which the world's food supply is being used up, has caused great pressure on food resources, land use, and the maintenance of natural resources.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the sustainable development, which relate to the above information.

Statements	*Yes*	*No*	*Do not know*
Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.			
Protection of natural resources is one of the basic issues in sustainable development.			
Environmental impact assessment is a very important process when development projects are in preparation.			
Before establishing any development policies, programmes, and plans the environmental impact of it must be considered..			
Five-Year Development Plans did not emphasise the application of environmental impact assessment.			
Any future development requires evaluation of plans, programmes, and policies.			
To achieve sustainable development environmental policies and development policies should be integrated.			

٢ - التنمية المستدامة :

لقد تم في القرن العشرين إحراز تقدم متقطع النظير في كل مجال من مجالات العلم والتكنولوجيا ولقد تخلل هذا القرن فترات زمنية سادها القلق حيال ما يترتب عن الاستغلال المتسارع لموارد الأرض. فقد أدى النمو السكاني والفقر في البلدان النامية والاستخدام المسرف للموارد الناتجة إلى ضغوط حادة على موارد الإمداد الغذائي واستعمالات الأراضي وقاعدة الموارد الطبيعية وعلى كل جانب من جوانب البيئة الطبيعية.

اقرأ العبارات التالية واجب بنعم أو لا أو لا علم حسب مفهومك لمصطلح (التنمية المستدامة) وهو مصطلح ذو ارتباط وثيق بالمفهوم المطروح أعلاه.

العبارات	نعم	لا	لا أعلم
١. التنمية المستدامة هي التنمية التي تولي احتياجات الجيل الحالي ولا تضر باحتياجات الجيل القادم.			
٢. استخدام الموارد الطبيعية المتجددة حصراً يعتبر أساسيات التنمية المستدامة.			
٣. عند إنشاء مشروع تصري كبير لا بد من دراسة التأثير على البيئة.			
٤. لا يمكن وضع أو تطوير سياسة أو خطة بيئية سليمة دون إجراء دراسة أولية للحصول بها والتأثر على البيئة.			
٥. خطط التنمية الخمسية لم تنص على دراسة التأثيرات البيئية للمشاريع التنموية الكبيرة.			
٦. أي تنمية مستقبلية تحتاج إلى تقييم التأثيرات البيئية لأي سياسة أو خطة أو برنامج مرجو.			
٧. لتحقيق التنمية المستدامة يجب أن لا يفصل بين الخطط والسياسات التنموية والخطط والسياسات البيئية.			

Environmental issues in the Kingdom of Saudi Arabia

The Kingdom's rapid population increase in the last 30 years has caused an increase in the number of urban centres which had a rural origin, and this has led to environmental problems for these centres of a type they have not experienced before.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the environmental issues in the kingdom of Saudi Arabia.

Statements	*Yes*	*No*	*Do not know*
Migration from rural to urban areas is one of the causes of the environmental problems in Saudi Arabia.			
The uncontrolled growth and development of the cities in Saudi Arabia is not one of the causes of environmental problems.			
The loss of the agricultural land in the oases in Saudi Arabia is one of the results of rapid urban growth, which have happened during the last 30 years.			
The loss of the agricultural land in the oases in Saudi Arabia is one of the results of environmental policies, which did not concentrate on the issues of oasis protection.			
The loss of agricultural land in the oases in Saudi Arabia is one of the results of the planning policies (land development control) which did not differentiate between urban centres and rural areas.			
The change of agricultural land to other uses, such as commercial, residential, and industrial uses did not resulted in the loss of agricultural land of the oases forever			

٣ - القضايا البيئية المعاصرة في المملكة العربية السعودية :

إن النمو والتطور السريع والتزايد لحجم السكان الذي شهدته المملكة خلال ٣٠ سنة ماضية أدى إلى ظهور عدد من المراكز الحضرية ذات الأصل الريفي مما جعلها تعاني من مشاكل بيئية لم تعانيها من قبل.

اقرأ العبارات التالية واجب بنعم أو لا أعلم حسب رؤيتك للقضايا البيئية المعاصرة في المملكة .

العبارات	نعم	لا	لا أعلم
١. الهجرة من الريف إلى الحضر إحدى أسباب المشاكل البيئية المملكة العربية السعودية.			
٢. النمو السريع وغير المنظم للمدن ليس أحد أسباب المشاكل البيئية في المملكة.			
٣. تناقص المساحات الخضراء في الواحات الزراعية أحد نتائج النمو السريع الذي حدث في المملكة خلال الثلاثين عاما الماضية.			
٤. تناقص المساحات الخضراء في الواحات الزراعية أحد نتائج السياسات البيئية التي لم تعالج بشكل كامل قضايا الواحات الزراعية.			
٥. تناقص المساحات الخضراء في الواحات الزراعية أحد نتائج السياسات والتدابير التخطيطية التي لم تفرق بين المدينة والريف.			
٦. تحويل الأراضي الزراعية للاستعمالات السكنية والتجارية والصناعية لم يؤدي إلى الفقد لأراضي زراعية فقط وأثر على خيمة الواحة الزراعية.			

Appendices

Renewable and non-renewable Natural resources

Natural resources are the elements used by people through the interactions and they may be divided into two kinds, renewable and non-renewable.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the renewable and non-renewable natural resources.

Statements	*Yes*	*No*	*Do not know*
The implementation of development projects without studying their environmental impact leads to the destruction of natural resources.			
The implementation of the industrial projects with out studying the environmental impact does not lead to environmental problems.			
The implementation of development projects in renewable natural zones can cause the loss of natural resources			
Development and construction in agricultural land causes the loss of soil characteristics.			
The pumping of the groundwater in large amounts for residential, commercial agricultural and industrial activities can damage future potential.			
The reclamation of land from the sea has caused the loss of the sea's natural resources.			
The increase of salinity in the soil caused by irrigation and other urban activities is affecting soil characteristics Adversely.			

١ - الموارد الطبيعية المتجددة والغير متجددة :

الموارد الطبيعية هي المكونات والموارد التي يستخدمها الإنسان من خلال تفاعله معها في هذا الكون ويمكن تصنيفها إلى نوعين :

- متجددة : وهي التي يمكن أن تتغير بالاستخدام مثل الماء والهواء والأرض.
- غير متجددة : هي التي تنفذ باستخدامها مثل البترول .

اقرأ العبارات التالية واجب بنعم أو لا أعلم حسب مفهومكم بالنسبة لتصنيفنا للموارد الطبيعية المتجددة والغير متجددة .

العبارات	نعم	لا	لا أعلم
١. إقامة المشاريع الصناعية دون دراسة تأثيراتها على البيئة يؤدي إلى استنزاف الموارد الطبيعية.			
٢. إقامة المشاريع الصناعية دون دراسة تأثيراتها البيئية لا يؤدي إلى تأثيرات سلبية وتلوث بيئي.			
٣. إقامة المشاريع الصناعية في مناطق توجد الموارد الطبيعية المتجددة أدى إلى استنزافها إلى الأبد.			
٤. إن عملية البناء واستخدام الأراضي الزراعية للاستعمالات السكنية والصناعية أدى إلى فقدان التربة الزراعية لخصائصها الطبيعية ومن ثم فقدانها الأبد.			
٥. إن عملية سحب المياه الجوفية بكميات كبيرة لاستخدامات زراعية وسكنية وتجارية يؤثر سلبي للاستخدامات المستقبلية.			
٦. عملية ردم المناطق الساحلية لم يؤدي إلى فقدان الموارد البحرية الطبيعية.			
٧. ارتفاع نسبة الملوحة في التربة نتيجة للتغير الحاصل في استعمالات الأراضي الزراعية الناتجة أدى إلى عدم ملاءمتها للزراعة.			

Environmental Policies in Saudi Arabia

As a result of the rapid urban growth that Saudi Arabia experienced in the last 30 years, there has been some negative impact on the country's environment. The government took steps to establish policies to solve the problems through its National Development Plans, through special programmes, through hearing conferences, and through international and regional meetings.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the environmental policies in Saudi Arabia.

Statements	*Yes*	*No*	*Do not know*
Environmental policies and plans include the protection of agricultural land at the national and local level.			
The National Development Plans encourage the achievement of sustainable development.			
Planning policies and standards have helped in the protection of agricultural land in the cases in particular and the protection of the environment in general.			
Planning policies and standards for the cities does not differ from the planning policies and standards in rural areas.			
The development control policies of urban centres are enough to achieve sustainable development.			
The urban development control for Saudi cities did solve all the environmental problems.			
MEPA and environmental agencies have carried out enough environmental studies and programmes at the local and national level in Saudi Arabia.			

٥ - السياسات البيئية في دائرة الاهتمام الوطني :

نتيجة التطور والنمو السريع لمدن المملكة خلال العقود السابقة بدأت الآثار السلبية لهذا التطور بالظهور وبدأ أثرها على الإنسان السعودي فتدخلت الحكومة في وضع السياسات لحل هذه المشاكل والحد منها من خلال الخطط الخمسية للتنمية ومن خلال من السياسات وعقد الاجتماعات والمؤتمرات الدولية والمحلية.

اقرأ العبارات التالية واجب بنعم أو لا أعلم حسب رؤيتك لتضمنها السياسات البيئية في دائرة الاهتمام الوطني من خلال المفهوم المطروح أعلاه.

العبارات	نعم	لا	لا أعلم
١. السياسات والخطط البيئية تحث على حماية المساحات الخضراء في الواحات الزراعية في المملكة على المستوى القومي والمحلي.			
٢. خطط وسياسات التنمية الحضرية حققت النمو المستدام في المملكة.			
٣. السياسات والخطط والبرامج التخطيطية ساهمت في الحفاظ على المساحات الخضراء في الواحات الزراعية بشكل خاص وعلى البيئة بشكل عام.			
٤. السياسات والمعايير لتخطيط المدن لا تختلف عنها لتخطيط القرى والأقاليم الزراعية.			
٥. سياسات تنظيم النمو الحضري للمدن كافية للوصول إلى تنمية مستدامة لمدن المملكة.			
٦. سياسات تنظيم النمو الحضري للمدن أدت إلى حل جميع المشاكل البيئية.			
٧. مصلحة الأرصاد وحماية البيئة لم تقوم بدراسات وبرامج بيئية كافية على المستوى القومي والمحلي في المملكة.			

Appendices

Government Institutions and Environmental Problems

Since the foundation of the Kingdom of Saudi Arabia it has been very important for the government to establish the institutions and the plans to guide development in the country and to provide all the high level services to the individual living in Saudi Arabia. It is thus very important to understand the relationship between these institutions to reach an acceptable solution to the environmental problems in general and the problem of the loss of cross land in particular.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the relationship between the government institutions under the current environmental problems.

Statements	Yes	No	Do not know
The co-operation between the Ministry of Agriculture, MEPA, and MOMRA is very close, and helps to achieve the protection of the environment in general and the protection of the agricultural land of the cross in parteular			
There are enough people who specialize in environmental impact assessment in MOMRA, the Ministry of Agriculture and Water, and MEPA.			
Ministry of agriculture, ministry of municipal and rural affair and Meteorology and Environmental Protection Agency provide the training programmes for environmental impact assessment for the kingdom s development projects.			
There are enough studies about the state of the environment in the Kingdom as general and the state of the cross in parteular			
There are enough environmental planners in the Kingdom of Saudi Arabia.			
Before the ministry concerned implements any development project it conducts an environmental impact assessment study.			
MOMRA follows the following steps when planning for development: 1. Goals and objectives. 2. Data collection and analysis 3. Establishing the planning standards and alternatives. 4. Selection of the best alternative 5. Implementation			
Environmental assessment should be taken into consideration in step No. 1.			
Environmental assessment should be taken into consideration in step No. 2.			
Environmental assessment should be taken into consideration in step No. 3.			
Environmental assessment should be taken into consideration in step No. 4.			
Environmental assessment should be taken into consideration in step No. 5.			

٦ - المؤسسات الحكومية ومشاكل البيئة المعاصرة :

منذ تأسست المملكة عام ١٩٣٢م كان هناك وعي لبناء دولة حديثة وذلك عن طريق إنشاء المؤسسات الحكومية التي ترعي الإنسان ومصالحه على أرض هذا الوطن الغالي. ولأننا حاليا نعيش في ظل هذه الدولة الحديثة كان لا بد من معرفة ترابط وتعاون المؤسسات الحكومية في ظل المشاكل البيئية المتعلقة بنقص الموارد الطبيعية وعلى الأخص المرتبطة بالمزامات الزراعية.

اقرأ العبارات التالية واجب بنعم أو لا أعلم حسب علمك بالنسبة لتعاون المؤسسات الحكومية في ظل المشاكل البيئية المعاصرة.

العبارات	نعم	لا	لا أعلم
1. التعاون بين وزارة الزراعة ووزارة الشؤون البلدية والقروية ومصلحة الأرصاد وحماية البيئة قوي في الحفاظ على البيئة بشكل عام والحفاظ على المساحات المخضرة والمزارعات الزراعية بشكل خاص.			
2. يوجد موظفين متخصصين في دراسات المكاثرات البيئية في وزارة الزراعة ووزارة الشؤون البلدية والقروية ومصلحة الأرصاد وحماية البيئة.			
3. تقوم وزارة الزراعة ووزارة الشؤون البلدية والقروية ومصلحة الأرصاد وحماية البيئة بتوفير البرامج التدريبية لتقييم ودراسة المكاثرات البيئية للمشاريع التنموية في المملكة.			
4. يوجد دراسات كافية عن واقع البيئة بشكل عام في المملكة والمزارعات الزراعية بشكل خاص.			
5. يوجد موظفين ومتخصصين في مجال التخطيط البيئي في المملكة.			
6. عند القيام بمشروع تنموي تقوم الوزارة المتخصصة في تنمية المشروع بدراسة المكاثرات البيئية لهذا المشروع قبل القيام بالموافقة على إقامة وتنفيذ المشروع.			
7. عند قيام وزارة الشؤون البلدية والقروية بالتخطيط لمشروع تنموي فإنها تتبع المراحل التالية: • أ. وضع الأهداف والغايات • ب. جمع المعلومات وتحليلها • ج. وضع المعايير وتطوير البدائل وتقييمها • د. اختيار البديل الأفضل • ه. تطبيق الخطة			
8. عند عمل المخطط فانه يؤخذ في الاعتبار الأوضاع البيئية في مرحلة رقم (أ)			
9. عند عمل المخطط فانه يؤخذ في الاعتبار الأوضاع البيئية في مرحلة رقم (ب)			
10. عند عمل المخطط فانه يؤخذ في الاعتبار الأوضاع البيئية في مرحلة رقم (ج)			
11 عند عمل المخطط فانه يؤخذ في الاعتبار الأوضاع البيئية في مرحلة رقم (د)			
12 عند عمل المخطط فانه يؤخذ في الاعتبار الأوضاع البيئية في مرحلة رقم (ه)			

The Future of environment and Development in the Kingdom

Good planning leads to balanced development, which meets the needs of the existing and future generations in the kingdom of Saudi Arabia.

Please read the following statements and in each case choose the answer (Yes, No, Do not know) which most appropriate in relation to your understanding of the future of the environment and development in the kingdom.

Statements	Yes	No	Do not know
The goal of sustainable development should not be taken into consideration when formulating the policies, plans, and programmes of urban and rural development.			
Clear policies, programmes, and plans for development projects are of vital importance in avoiding future environmental problems.			
Environmental impact assessment study is a very important step when formulating development policies for cities or rural areas.			
Educating the public about the environment and the negative impact of development on the environment is not very important factor in reaching the sustainable development goal.			
Educating the public is very important, and it leads to sustainable development.			
The government institutions are responsible for the implementation of the plans, policies, and programmes to achieve sustainable development.			
The media is one important way to educate the public about environmental issues.			
Education institutions play a very important role in explaining the importance of the environment and how to reach sustainable development.			
The co-operation of the public in the implementation of the planning process is very important as leading in the end to sustainable development.			

٧ - مستقبل التنمية والبيئة في المملكة :

التخطيط السليم يؤدي إلى تنمية متوازنة ويحفظ للجيل الحالي والأجيال القادمة حقوقهم للعيش في رفاهية على أرض المملكة الغالية.

اقرأ العبارات التالية واجب بنعم أو لا أعلم من وجهة نظرك بالنسبة لقضايا مستقبل التنمية والبيئة في المملكة.

العبارات	نعم	لا	لا أعلم
1. السياسات والخطط التنموية الهادفة الوصول إلى التنمية المستدامة لا يجب أن توخذ في الاعتبار عند عملية الحد والقرى والأرياف.			
2. وضوح السياسات والخطط التنموية للمشاريع مهم لتفادي المشاكل البيئية المستقبلية.			
3. دراسات المكاثرات البيئية أحد الخطوات المهمة عند وضع الخطط التنموي لمدينة أو قرية.			
4. توعية الفرد والمواطن بالمشاكل البيئية عنصر أيس مهم للوصول إلى التنمية المستدامة.			
5. المؤسسات الحكومية جميعها مسؤولة عن ترجمة الخطط والبرامج الكفيلة للوصول للتنمية المستدامة.			
6. الإعلام المرئي والمقروء من أهم الأدوات والطرق لتوعية المواطن عن أهمية الحفاظ على البيئة ومواردها.			
7. المؤسسات التعليمية تقوم بدور فعال في مجال توضيح الحفاظ على البيئة وطرق الوصول إلى التنمية المستدامة.			
8. مشاركة المواطنين في تطبيق التخطيط والخطط التنموية عامل مهم يؤدي في النهاية إلى تنمية مستدامة.			

Appendices

Comments and Suggestions

If you have any comments or suggestions on the subject of sustainable development in the Kingdom of Saudi Arabia in general, or how to protect the agricultural land of the cases in the Kingdom, please write them in the space provided below.

Special Questions

Place of Work ..... Title of Post .....

How long have you been working in this post? .....

د. الدراسات:

٤٧ أمي الكريم هل لديك أي الدراسات عن التنمية المستدامة في المملكة العربية السعودية بشكل عام وكيفية الوصول إلى حلول للحفاظ على المساحات الخضراء في الدراسات الزراعية في المملكة وتنميتها تنمية مستدامة. الرجاء إعطاء الدراسات وأمثلة إن استطعت.

١ - أنه لنص المراني تقف لغير صدرس لمندسات الصندوق لتنمية
- العقاري حتى تم إقتطاع من أراضي خصبة لا يتم
- تعويضها بأي حال من الأحوال

٢ - أن يكون السبب الأساسي في إيجاد حل
- وبشكل فاعل في رفع نسب التلوث في مدينة الملك
-

٣ - لا توجد موسيقات تقنين تشريعي للمخالفات
- وإنه وجدت فإنها قليلة.
-

٤ - نسبة من المشاريع الزراعية تقام في أراضي الاستغلال
- الجائر للثروة المائية بشكل يضمن تجدد
- نسب الفقد في البذر ويجب تطويرها لتحقيق أعلى
-

٥ - توعية المزارع بأفضل طرق الري.

٦ - توعية المواطن بأهمية المياه الغير مكررة.
- توعية المواطن بتكاليف تحلية المياه.
-
-
-
-
-
-

* أسئلة خاصة
مكان العمل ..... طبيعة العمل (المسمى الوظيفي) .....
المدة التي قضيتها في العمل .....

Appendices

Dear planners

The city planning is knowledge depend on the understanding and the availability of the information which has the direct impact on the provision of the services. Please answer the following questions?

According to your experience in the urban and regional planning do you think it is important to do environmental impact assessment for every project before the a approval stage?

If the answer is yes, what are the steps that the municipality follow in this matter.

.....

.....

.....

2-is there a co-operation between the municipality and MEPA as an agency responsible in the environmental field in the plan making process.

.....

.....

.....

3-through your experience and involvement in the urban and regional planning do you think the existing planning policies and standards is enough to deliver the sustainable development in the Oasis?

.....

.....

.....

4-is the existing co-operation between the municipalities and MEPA in term of information provision at the national level or the local one Please gave examples?

.....

.....

.....

5-how do you see the co-operation of the Oasis residents in the process of the development and environmental protection of the Oasis, please gave examples?

.....

.....

.....

6-do u have any notes or comments on the al-Qatif Oasis development plans and studies which may reflect the sustainable development concept in the plans and studies?

.....

.....

.....

with my best regards

Fauz saad Al-shihri

أخي مهندس التخطيط الحضري والإقليمي

إن التخطيط الذي علم يعتمد كثيراً على المعرفة وتوافر القاعدة المعلوماتية الكبيرة والدقيقة والتي توافر كثيراً على نوعية التخطيط ، وبناءً الإجابة على ما يلي : ـــ

١ ـــ طبقاً لخبراتك في حقل التخطيط الحضري والإقليمي ، هل تعتقد أنه يلزم عمل دراسة للتأثير البيئي لأي مشروع تخطيطي قبل الموافقة عليه ؟

إذا كانت الإجابة نعم فما هي الخطوات التي تتبعها البلدية في ذلك ؟

٢ ـــ هل تعاون أو ارتباط بين البلدية ومصلحة الأرصاد وحماية البيئة كجهة مسئولة في المجال البيئي وذلك في مراحل أعداد الخطط ؟

٣ ـــ من خلال مشاركتك في حقل التخطيط الحضري والإقليمي ، هل تعتقد أن التوسع والأنشطة البشرية الحصول لها حالياً كانت الوصول إلى تطوير تخطيط مستدام بالنسبة للواحات ؟

٤ ـــ هل تعاون مصلحة الأرصاد وحماية البيئة في إمداد البلديات بالمعلومات اللازمة على المستوى المحلي أو الوطني ، ورجاء إعطاء أمثلة ؟

٥ ـــ كيف ترى تعاون سكان الواحات في تطويرها أو المشاركة في المحافظة عليها بيئياً ، ورجاء إعطاء أمثلة ؟

٦ ـــ هل لديك أي ملاحظات بالنسبة لمخططات تطوير واحة القطيف بحيث تكون ذات فائدة تعكس فكرة الاستدامة في المخطط ؟

مع جزيل شكري وتقديري

أخوكم الباحث / فائز بن سعد الشهري

Appendices

1- Occupation:
2- Age:
3- Place of living in the oasis:

4- What do you know about the sustainable development?

5- Did the natural resources of the Oasis decreased during the last three decades? And what do you think is the impact of that?

6- What are the reasons behind these decreases?

7- The Ministry of Municipal and Rural Affair and the Ministry of Agricultural and Water play a very important role in the development and protection of the Oasis's what do you think?

8- What do you think about the planning standards applied in al-qatif oasis? Did it result in the protection of the natural resources of the oasis? And did it contribute to the improvement and enhancing the arcitectural image of the oasis?

9- Do you have any further comments about the subject?

Appendix II

Planning Standards Used in Al-Qatif Oasis by the Master Plan in 1976

Elementary schools

The average number of students per classroom is 30, and it is suggested that elementary schools of 15 classrooms should be built.

A suitable dimension for the plot of each school is 10,000 sq m (1 hectare), and it should not be less than 80 x 95 m.

The maximum walking distance to elementary school should be 600m (10minutes).

Intermediate Schools

The number of students per classroom is to be 30. For the proposed type of intermediate schools 15 classrooms should be built.

A suitable dimension for the plot of each school is 10,000 sq m (1 hectare), and it should not be less than 80 m x 100 m.

The maximum walking distance to intermediate school should be 900 m (15 minutes).

Secondary Schools

The number of students per classroom is to be 30.

The plot dimension should be 100 m x 110 m (11,000 sq m) if possible, and certainly not less than 95 m x 110 m.

Technical Education and Teachers' Institutes

It is suggested that technical schools and teachers' institutes should have 24 classrooms, each 100 m x 100 m.

Sewing Institutes (for Girls)

Sewing institutes should be of the 15 classroom type.

Plot dimensions should be 100 x 100m, with a minimum of 80 m x 70 m.

General Remarks

The same ratios are applicable for girls as for boys. The locations of girls schools shall be distant from boys' schools. Schools should be grouped near each other when possible, as far as site properties, general layout, and walking distance are concerned. This is in order to create shared sports, cultural, and educational facilities. Schools should be flexible in design relative to classroom numbers. It is suggested that school playing fields should be made available for use by the local population also.

Local Mosques

There should be one local mosque per 2,500-3,000 or so, inhabitants or 400-500 dwelling units. This mosque is to be designed for 600-625 prayers, taking into account san area of 1.2 sq m per prayer. The walking distance to a local mosque should be no more than 350-500 m in for any local resident, though this may depend on the population density of the neighbourhood.

A local mosque should have an area of approximately 750 sq m.

Jomah Mosques

There should be one jomah mosque for about 4 to 5 local mosques, or 15,000 inhabitants (2,500 dwelling units), though the population density of the area should be taken into account. This mosque is to be designed for about 1500 prayers. As for local mosques, 1.2 sq m is to be considered as the appropriate praying area per prayer.

The area of a jomah mosque should be approximately 1,800 sq m.

Eid Mosque

The eid mosque must be big enough to give space to pray for about 30-35% of the population of the area which it serves. 0.6 sq m praying area should be provided per prayer.

A site would be allocated for an eid mosque for a population of about 100,000 persons.

Health Facilities

Dispensaries as defined by the ministry of health are medical centres, each serving a population of between 35,000 and 40,000 inhabitants. Each dispensary is visited daily by between 600 and 800 individuals.

A dispensary would provide for ambulance services, and general medical services.

There should be space for ten examinations per 1,000 inhabitants at any one time, with an area of 4 sq m per examination. Thus the area required would be about 1400 sq m for a dispensary serving an urban sector of 35,000 inhabitants. It should be located in the central area of the community.

There should be smaller medical centres (clinics), each to serve a smaller radius of residential areas (10,000 inhabitants), to be located in the zone of quarter facilities.

Hospital bed numbers are to be calculated on the basis of 3 beds per 1,000 inhabitants.

The floor area of hospitals is to be calculated on the basis of 50 sq m per bed. (A general hospital should have 300 - 400 beds).

Ideally hospitals should be located near open spaces or green areas.

Shopping Areas

Quarter Shopping Centre

Such a centre offers facilities for business retailing tools and drugs, and offering laundry, barbering, repair etc. services; in other words it supplies day to day living needs.
According to US. standards shoppers will not travel more than six minutes driving time

for daily convenience needs. Taking into consideration the variation of shopping habits between Saudi Arabia and the USA, it is estimated that the quarter shopping centre would serve around 2,000 families.

There would be also the possibility of using cars to deliver goods directly to the houses.

The maximum walking distance to the quarter shopping centre from any point within the area to be served should 1.5 km (about 30 minutes). This distance might be reduced according to design possibilities.

Shopping centre area is to be calculated on the basis of a floor area of 3 sq m per family for circulation and parking, 3 sq m per family for planning, and an open area of 1.5 sq m per family.

The building space calculated will be distributed over commercial strips (souqs) along shopping streets and neighbourhood and quarter shopping areas.

Corner shops will be provided every one on two blocks (neighbourhood units), depending on the size of the block, and taking into consideration that the walking distance should not exceed 300 m (5minutes).

A community centre serving an urban sector of about 30,000 inhabitants should be designed to include commercial activities.

The estimation of areas for shopping facilities is calculated 0.8 ha for 1,000 inhabitants.

Thus 10 ha would serve a population of 100,000 inhabitants.

Public Administrative Sector

Post Offices

In addition to the central post office, secondary ones are to be located in the community centres and smaller ones in the quarters (a small post office should serve 6,000 to 8,000 inhabitants).

Fire Stations and Civil Defence Buildings

In average residential areas the maximum distance between a fire station and any point on the site should not exceed 4.5 km.

The preferred location for a fire station would be an intersection of roads.

Police Stations

(Types of police station are defined by the Engineering Department, General Security, Ministry of the Interior.) They are, in increasing size:

1. Police station to serve a residential quarter of approximately 1 km diameter.
2. Police station category 'A' to serve an urban sector of approximately 6 km diameter.
3. Police station category 'B' to serve an urban settlement (a city).
4. Police headquarters category 'A'.

Each one of these stations contains a traffic department which has a similar programme to that of the police station.

Enough parking space should be provided to every police building.

The preferred location is near the intersection of principal roads (i.e. roads of at least 20 m in width).

Cultural Facilities

A small cultural centre may comprise a public library and a multipurpose hall.

The library floor area is to be calculated on the basis of 50 sq m per 1,000 inhabitants of the urban sector.

The multipurpose hall floor area is to be 50 sq m per 1,000 inhabitants of the urban sector.

Cemeteries

It is proposed that the existing cemeteries inside the town should be limited , fenced and planted with trees anew site for cemeteries reserve was proposed out side the master plan in the zone to south of the exsting town..

Recreation and Green Areas

Type of Facility	Ha/1,000 persons	Population Served	Average Size (ha)
Neighbourhood recreational area	0.15	15,000/25,000	0.3
Quarter rec.(1) areas and sports fields(2)	0.20	6,000/8,000	1.4

Urban sector rec. areas and sports fields(3)	0.25	40,000/60,000	1.2
Community rec. areas	0.30	The whole town	-

(1) integrated with quarter facilities

(2) integrated with elementary schools and quarter facilities

(3) integrated with secondary school; a major recreational and green area is located near the community centre of each urban sector

Appendix III

Present Planning Standards Used by the Municipality in Al-Qatif Oasis

School	School Population (Inh.)	Required Area(sq m)	Sq m per pupil	Location Requirement
Kindergarten	3000-9000	500-800 Av. 650	4.0	Accessible to pedestrian walkways with the residential area.
Elementary	3000-7000	1500-3000 Av. 2250	5.0	Accessible to the residential area.
Intermediate (boys or girls)	9000-18000	5500-11000 Av. 8250	15.0	Accessible to local road.
Secondary (boys or girls)	25000-50000	11000-20000 Av. 15500	20.0	Accessible to major road.

Education standards

Sources: MOMRA's Urban Limit Project (1987);Al-fehaid, (1995).

Type of measurement	Local mosque	Jomah mosque	Eid mosque
Served population (inh)	2000-5000	7000-15000	100000-150000
Mosque occupancy (persons)	800-2000	2000-4000	25000-40000
Total area required for praying people(total floor area((sq m).	1000-2400	2500-4500	35000-50000
Total lot area (sq m)	150-600	300-1500	1500-3000

Religious standards

Appendices

Facility	Measurements					
	Served population	Total lot area sq m	Total lot areasq m	Total area for each inhabitant density low	high	Served area (m)(half diameter)
Dispensary 'A' (mother & baby care clinic & health counselling centre)	12000-20000	900-1500 sq m	1200-2000 sq m	0.12 sq m	0.1 sq m	300-600 (m)
Small general hospital (general clinics)	40000-50000	1500-3000 sq m	2800-5000 sq m	0.1 sq m	0.7 sq m	600-1500 (m)
General hospital	160,000 (inh)	40,000 sq m	20,000 sq m			3000-5000 (m)

Health facilities standards.

Location facility	Served population (inh.)	Total floor area sq m	Lot area sq m	Total inhabitant sq m	Area per requirement.
Branch municipality 'B'	20000-30000	600-1000	500-600	0.02-0.025	Community centre
Library and public hall	20000-30000	2500	1000-3000	.03-0.1	Community centre
Post office :local 'B' (stamps,phones,boxes) local 'A' (all kind of postal services)	5000-10000 20000-40000	150 500-1200	200 400-800	0.03 0.02	Community centre
Police station: Local station Main station	20000 100000	200-300 600-1000	500-800 1000	0.00.01	Accessible to major roads
Fire station	50000-80000	1000-4000			Accessible to major roads
EMARAH	20000-30000	600-1000	500-600	0.02-0.025	Community centre

Public facilities and governmental offices standards.

Facility	Level of service	Serviced population	Lot area sq m	Area/inh. sq m/inh.	Location requirement
Garden	Cluster	5000-10000	2000-4000	0.4	Located next to kindergarten or elementary school.
Playground area: (area with football playground, tennis court. All purpose space for all ages. Area for ladies separated with fence)	Community level	20000-30000	10000-30000	0.04-1.0	Located next to intermediate or secondary school.

Open spaces and playgrounds standards.

Commercial facilities standards.

Facility	Served population (inh)	Total floor Area (sq m)	Total lot area (sq m)	Location requirement
Local stores: daily needs from different stores such as grocery, butcher , baking, tailors, pharmacies, meat market etc.	6000-10000	0.45	50 sq m per store	Accessible to local roads in cluster level
Neighbourhood commercial centre (weekly needs).	Upto 50000	0.60	1.0-2.5 sq m for inhabitants.	Accessible to neighbourhood centre and major road intersections.

Cemeteries

The proposed standard by MOMRA is about 3 sq m per inhabitant and 500,000 sq m as the lowest acceptable area for cemeteries. There are two factors affecting the location decision:

Soil. This should be the same as in agriculture soil, with good drainage capacity.

Urban environment. The cemeteries should be located outside the residential area and separated with natural boundaries.